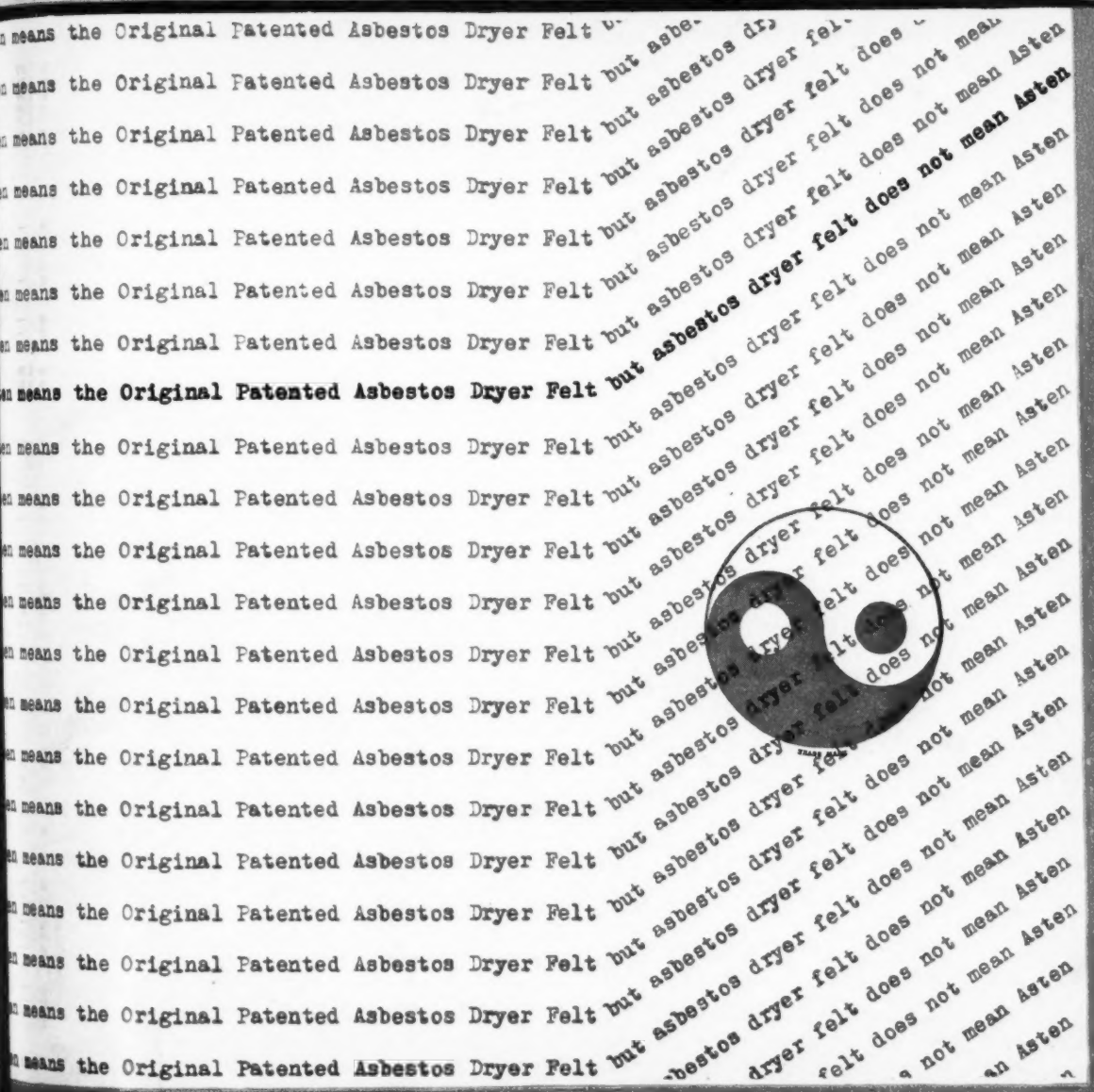
PAPER TRADE JOURNAL

THE INTERNATIONAL WEEKLY OF THE PAPER AND PULP INDUSTRY AND THE PIONEER PUBLICATION IN ITS FIELD



AUG. 18 1938

Vol. CVII No. 7

with an ADKA SAVEALL

• If the regulation of stream pollution in your state is causing you concern, these two facts should interest you and demand investigation.

1 **An ADKA Saveall will end all white water stream pollution at your mill to the satisfaction of the state authorities.**

2 **The ADKA installation should pay for itself out of savings in from one to two years.**

There's no guesswork to predicting ADKA results and savings. A Dorr engineer with a portable test kit and "return on investment sheet" will gladly demonstrate both at your plant.

Write now for the ADKA Saveall Bulletin and a test kit demonstration of results and savings.

DORRCO

• STREAM POLLUTION

ADKA effluents contain only 0.2 to 0.4 lbs. of stock and filler per 1000 gals. Installations in Pennsylvania are meeting with ease the state pollution specification—not more than 3 lbs. of waste stock and filler per ton of paper making capacity.

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ADKA's make the highest recoveries of all savealls on the market—95-98 per cent.

Of nine installations investigated recently, 3 were returning the installed cost in 6 months; 2 in 12 months; 1 in 15 months; 2 in 18 months and another in 21 months.

• WATER REUSE

Where city water is purchased or river water must be clarified and softened, an ADKA will show surprising savings.

One mill uses 2 ADKA's for this purpose—a large one clarifying white water for reuse as shower water and a smaller one for recycling felt shower water.

The felt shower water is not only crystal clear, but also contains the greater part of the original heat units and softening chemicals.

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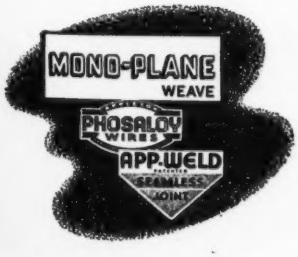
APPLETON

wires are GOOD



WIRES

APPLETON WIRE WORKS. INC.

APPLETON, WISCONSIN

WHEN HE MODERNIZED HIS OFFICE, HE MODERNIZED COMMUNICATION METHODS TOO

A modern setting, alone, doesn't make a business modern. Impressive as atmosphere may be to visitors, up-to-the-minute communication is just as important: to the executive, the salesman, the factory foreman, the warehouse manager, the shipping clerk, the *customer*.

Within *your* business may exist opportunities for stepping up efficiency and making economies through modern communication methods. Why not go into it with a Bell System representative? Many other businesses have found such a joint survey highly profitable.

A meat packer, for example, found that by installing Private Line Teletypewriter Service, the average order-handling time between headquarters and distant sales offices was cut in half, and four operations were eliminated. *Your* check-up may lead to even greater savings. It costs nothing to find out. Just call your local telephone office. Why not do it *now?*

PAPER TRADE JOURNAL

Reg. U. S. Pat. Off.

SIXTY-SEVENTH YEAR

PAPER

Established Feb. 17, 1899
Consolidated Nov. 16, 1899
with Paper Trade Journal.

Vol. CVII, No. 7 Thursday, August 18, 1938

Established Sept. 21, 1918
Consolidated Feb. 19, 1925
with Paper Trade Journal.

New Credit Terms for Hearst on Newsprint

New Credit Arrangement Will Involve More Substantial Collateral for Shippers and Will Also Include Removal of Hearst Buying As A Threat To the Price Structure — $20,000,000 of Newsprint Annually Involved.

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., August 15, 1938—As a result of conferences between representatives of newsprint companies, banks and the Hearst interests agreement has been reached whereby new credit arrangements have been extended to the Hearst group of newspapers in connection with their newsprint purchases. Under the new arrangements newsprint is to be supplied on a four months' credit basis. Banks cooperating in the credit plan are the Chase National Bank of New York, Banque Canadienne Nationale, Imperial Bank of Canada, Bank of Montreal and Royal Bank of Canada.

Firms Having Contracts With Hearst Group

Canadian newsprint companies having contracts with the Hearst group include: Lake St. John Power and Paper, Brompton, Anglo-Canadian Paper Mills, Abitibi, Canadian International, Mersey, Donnacona, Donohue Brothers. The Hearst chain contracts for about $20,000,000 of newsprint annually.

Threat To Price Structure Removed

Commenting on the arrangement, the *Financial Times* of Montreal says:

"The new credit arrangements, which involve, starting with August delivery, more substantial collateral as protection of shippers, also, it is understood, include removal of Hearst buying as a threat to the price structure.

"Importance of this angle is outstanding, as a large part of the trouble of the industry during the past 10 years has been due to ability of Hearst, with his large and tempting block of tonnage, to get one or another company to cut prices to get his business; and with the interlocking of contracts that has been in effect this has meant reduced price for the entire industry.

Signs of Improvement

"With business showing evident signs of improvement in the United States, and fall newsprint consumption likely to show more than a seasonal increase, step-up in operating rate of Canadian newsprint mills is in sight before the end of the year.

"During the first half of 1938, publishers' stocks of newsprint in the United States declined to 436,696 tons from 766,758 tons. July and August will see further reductions in these stocks, evidence at hand reveals, so that the publishers' inventory position, as the fall season of heavy newsprint consumption approaches, is close to normal.

Consumption Reaches High Point

"Newsprint consumption during the final four months of the year seasonally reaches the highest point of each year. Normally, October sees the largest amount of newsprint used, with November only slightly below. Indicated business improvement in the United States will stimulate the demand this year.

"Thus, the Canadian industry expects considerably heavier demand during the balance of the year, and it is probable operation in the industry will be stepped up, possibly to 65 per cent of capacity against around 50 per cent so far this year.

Fears of Price Reduction Removed

"Looking ahead to the new year, it is expected that with inventory position of the newsprint industry in a more healthy position, and particularly should present business upturn continue, a much better situation for the industry will prevail in 1939, certainly in the early months. Recent developments have almost entirely removed the fears of a price reduction from the present level of $50 and, with a better operating rate next year, newsprint companies generally should be able to show the best earnings in some time."

Herty Foundation Laboratory Plans

At a meeting of the Board of Trustees of the Herty Foundation August 6th at Lakeland, Ga., it was voted to carry out the work of the Foundation Laboratory according to the plans and intentions of the late executive director, Dr. Charles H. Herty.

Supervision of the foundation business will be in the hands of James Fowler, chairman of the executive board, and Elliott W. Reed, secretary-treasurer. Dr. Charles Carpenter, assistant director of the Laboratory since January 1938 will continue in charge of experimental operations.

Submits Plans For $26,000,000 Development

Wisconsin Hydro Authority Delivers Plans for Big Water Power Project On Wisconsin and Fox Rivers To Federal Departments — P. W. A. Financing Expected — Plan To Reduce Industrial Accidents—Other News.

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., August 15, 1938—War Department engineers at St. Louis, Mo., have been given copies of the plans for the proposed $26,000,000 water power development on the Wisconsin and Fox Rivers by the Wisconsin Hydro Authority, and have been asked to determine whether the project, to be financed by a PWA grant and loan, interferes with existing works constructed on the Mississippi River by army engineers. It is anticipated there will be no objections on this score.

Plans Submitted to Federal Commission

The plans also will be submitted to the Federal power commission at Washington to determine whether the sale of power will be in interstate commerce. A determination also must be made whether the project interferes with or affects navigation. With These determinations out of the way, action is expected on the PWA financing. No federal power permit will be requested until PWA approval has been given.

In the three power plants to be constructed at Knowlton, Necedah and Germantown, there is a pool of 227,000,000 kilowatts of power annually. The electrical energy now generated in Wisconsin will be increased approximately one-tenth.

Germantown Pond to Cover 17,000 Acres

Germantown, the third unit, will have a power head of 28 feet, and a pond of about 17,000 acres, backing up the water thirteen and a half miles. There will be thirteen flood gates 30 feet wide and 18 feet deep, and the flowage capacity will be 100,000 cubic feet per second. The plant is estimated to generate 78,000,000 kilowatt-hours of firm power per year.

Estimates are now placed at $1,000,000 for a diversion canal from the Wisconsin River to the Fox River, to supply 1,500 cubic feet of water per second to provide uniform flow for mills along the Fox. The canal will be approximately two miles in length, and 105 feet wide. It will be located at Portage, Wis.

United States government figures indicate there is available for storage above the Mosinee dam an average of 35,000,000,000 cubic feet of water annually which formerly escaped in the spring and fall floods. The Big Eau Pleine reservoir now impounds about 4,000,000,000 cubic feet annually, and the proposed Little Eau Pleine has an estimated average capacity of 25,000,000,000 cubic feet. Five-sevenths of the water now wasted will be stored for the benefit of paper mills needing a uniform flow the year around.

By-Pass Canal 6½ Miles Long

After the dam of the Mosinee Paper Mills Company at Mosinee has been modernized, enlarged and strengthened, a by-pass canal will be built. It will be six and a half miles long and 265 feet in width. The project calls for the removal of 5,500,000 cubic yards of earth. Flood waters from the enlarged pool above the dam will be diverted into the Big Eau Pleine reservior, built by the Wisconsin Valley Improvement Company with private capital in January, 1937, at a cost of $800,000. The new reservoir to be constructed on the Little Eau Pleine River, and connected by a tunnel with the Big Eau Pleine, will cover 35,000 acres, making it one of the largest inland bodies of water in the state. The diversion tunnel will be 1,900 feet long and 30 feet in finished diameter.

The first of the dams to be constructed at Knowlton will have a head of 25 feet and will generate approximately 94,000,000 kilowatt-hours of firm power per year. This dam will flood approximately 7,500 acres of land. With a water shed of about 4,900 square miles, this dam is regarded as one of the most outstanding in the country.

The Pentewell dam near Necedah will include a flowage of about 19,000 acres of land. It will be the largest unit of the project, and will furnish an estimated power output of more than 100,000,000 kilowatt hours per year of firm power, and 26,000,000 kilowatt-hours of secondary power.

Plan to Reduce Industrial Accidents

Plans are being made by the Kimberly-Clark Corporation, Neenah, Wis., for its annual Safety Day, to be held either August 27 or 28. There will be first aid exhibits, safety posters and movies. The company is striving for a no-accident record for the last half of the year.

Gilbert Paper Company, Menasha, Wis., has erected a cardboard model of a workman holding two thermometers so the employees may see each day the comparison of the accident record with the previous year. Under the model is the caption, "Always Be Careful." Thus far this year, the mill has had nine accidents, only two of which were lost-time. Last year during the same period there were eighteen, eight of which were lost-time. Mill employees are divided into eight groups, with a monthly change of captains for each. Cash awards are given each six months. Monthly meetings of executives and departments are held to study the causes of all accidents occurring, and regular inspections are made.

Bergstrom Paper Company, Neenah, Wis., has operated thus far this year with only one accident. The record is the result of weekly accident surveys and charts showing amount of time lost. Employees are informed what the annual cost of the accidents amounts to.

The Menasha Products division of the Marathon Paper Mills Company has a newly inaugurated safety program, with Walter Strong in charge. Many progressive safety ideas already have been incorporated and the plant has been entered in the National Safety Council contest. The safety committee is made up of foremen of all departments. Monthly meetings

and inspections are held, and a dinner was staged recently to celebrate a "no accident month."

George A. Whiting Paper Company, Menasha, Wis., has a record that is commendable. It had no lost-time accidents during the last year, and maintained that record during the first six months of this year. Mill employees are on its safety committee.

Commission Approves Power Tolls

Approval has been given by the Wisconsin Public Service Commission to the Wisconsin Valley Improvement Company, Wausau, Wis., to levy tolls of $128,857.75 against paper mills and other water power users of the Wisconsin River for the first six months of 1938. Rhinelander Paper Company will pay $2,608.30; Tomahawk Pulp Company, $1,048.69; Tomahawk Kraft Paper Company, $4,261.73; Wausau Paper Mills Company, $3,434.11; Marathon Paper Mills Company, $4,556.81; Mosinee Paper Mills Company, $3,663.25; Consolidated Water Power and Paper Company, $32,598.28; Wisconsin River Paper and Pulp Company, $9,452.56; Whiting-Plover Paper Company, $215.32; Nekoosa-Edwards Paper Company, $19,316.30.

Balliet-Ruprecht Engagement

Announcement has been made of the engagement of David Balliet of Chicago, and Miss Cornelia Ruprecht of Batavia, N. Y. Both attended the University of Chicago. The wedding is to take place in the fall.

They will reside at Kalamazoo, Mich., where Mr. Balliet will be associated with the Kalamazoo Wax Paper Products Company.

A.S.M.E. Committee on Rubber, Plastics

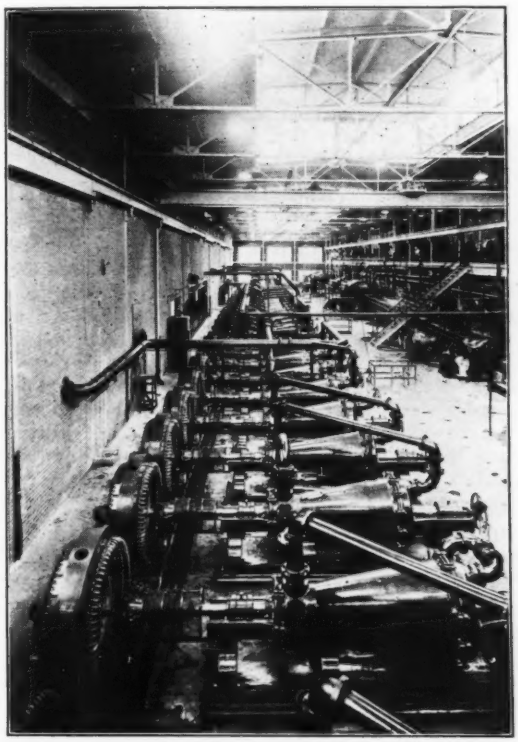
That applications of rubber and plastics are rapidly forging ahead is clearly evident from the attention now being devoted to these materials. Indicative of the trend, the American Society of Mechanical Engineers recently established a committee, or subdivision, on rubber and plastics which will deal with several phases of the rubber and plastics industries including mechanical applications, research on basic mechanical properties, processing equipment, and standards. Activities of the group will be beyond the normal range of other professional organizations in an effort to fill the present conspicuous gap in the mechanical field.

The committee will sponsor the presentation of papers at technical sessions of the regular quarterly meetings of the A. S. M. E. A symposium on rubber, comprising four invited papers covering the history of rubber; synthetic substances with rubber-like properties, fabrication of rubber parts, and certain mechanical properties of rubber is included in the program of the next meeting of the society to be held at Providence, October 5-7. Participation in activities of the committee will not be restricted to members of the parent society.

Authors of papers believed suitable for presentation at subsequent quarterly meetings should communicate at least four months in advance with Dr. J. F. Smith, Edward G. Budd Manufacturing Company, 25th street and Hunting Park avenue, Philadelphia, Pa., secretary of the rubber and plastics committee; or with the chairman, Dr. F. L. Yerzley, E. I. du Pont de Nemours & Co., Inc., P. O. Box 525, Wilmington, Del.

Longest Line-Up of Synchronous Motors

Believed to be the longest paper mill line-up of synchronous motors in the world, these 34 General Electric 350-h.p. motors are driving Jordans in the new kraft mill of the Union Bag and Paper Corporation at Savannah, Ga. They total 11,900 h.p. and are the largest single installation of such motors in the paper industry.



34 G-E SYNCHRONOUS MOTORS EACH COUPLED TO E. D. JONES & SON MAJESTIC JORDON.

New Instrument Catalogue

A new 64-page catalogue entitled "TAG Indicating, Recording and Controlling Instruments for Temperature and Pressure" has just been published by C. J. Tagliabue Manufacturing Company. It is more than a regular listing catalogue for it presents information in a clear, understandable way on the latest TAG instrument developments.

In addition to the new line of recording thermometers and recording pressure gages with 10 and 12 inch charts, complete data will be found on indicating and recording controllers. The control instruments are listed in either the "on-off" model for all ordinary control applications, or the Throttling model for use where any considerable apparatus lag is encountered.

Many illustrations not only show how these pressure-spring instruments operate, but the practical installation photographs tell an interesting story of what they are doing for the process industries.

A copy of Catalogue 1060D will be sent free by addressing C. J. Tagliabue Manufacturing Company, Park and Nostrand avenues, Brooklyn, N. Y.

Heavy Stocks of Pulpwood Await Shipment

Sap Peeling Season In Northern Ontario Recently Closed Showed Amount of Wood Cut Is 25 Per Cent Less Than In 1937 — Better Prospects for Building Paper—Sawyer-Stolk Co. Acquires Timber Limits.

[FROM OUR REGULAR CORRESPONDENT]

TORONTO, Ont., Aug. 15, 1938—The sap peeling season for pulp wood closed recently and in northern Ontario the amount of wood cut was only about three quarters of what it was last season. There were no labor disturbances and heavy stocks of wood are at several points in various parts of New Ontario awaiting shipment. The fall movement has not yet begun. Many mills a year ago last winter overbought and when recession set early in 1938, did not take their usual consignments. They are now beginning to consume inventories and the improvement should be gradual from this date. Prices remain much the same as they were except where there is a high cost for freight. Private cutters of wood, who have not disposed of their last winter harvest, have been endeavoring to find a market for their stock.

Better Prospects for Building Papers

It is announced by the Department of Finance, Ottawa, during the first half of the year, 1938, 32,-164 home improvement loans amounting to $13,214,-000 have been made in cities and towns in Canada with a population of five thousand or over. With the enlargement of the provisions of the act and the removal of the eight per cent sales tax on all building materials, it is expected that several firms turning out building papers will experience a substantial gain in output. Among these is the Dryden Paper Company, Dryden, Ont., who are of the opinion that the prospects for the remainder of 1938 are much brighter.

De Witt May Form Canadian Cellulose Company

Francis De Witt, of New York, who is the co-discoverer with Paul Bryant of a new fabric made from cellulose was in Ottawa lately and said that he considered that city as a desirable point for the making of the base material or pulp used in the process. The plant of Mr. De Witt's company is located at Worcester, Mass., and he stated that it is his intention to license a Canadian company as he feels that a Canadian business should be Canadian owned and operated in an area close to raw materials. A company in the Dominion would escape the tariff barriers which confront a United States organization.

Mr. De Witt referred to his product as the sixth fabric. Cotton, wool, linen, silk and rayon are the other five. Products introduced through Mr. De Witt's processing are disposable or, in other words, they are thrown away when dirty, selling originally at less than the cost of laundering.

S. F. Duncan Observes 64th Anniversary

S. F. Duncan, President of Provincial Paper, Limited, Toronto, recently observed the sixty-fourth anniversary of his birth and received the congratulations of many friends in the industry. It is nearly thirty years since he came to Toronto and became associated with the late I. H. Weldon in the old St. Lawrence Paper Company, the name of which was later changed to its present designation. Previous to moving to Canada, Mr. Duncan was with the Bryant Paper Company, Kalamazoo, Mich., for several years. He is regarded as one of the ablest and at the same time one of the most modest executives of the pulp and paper producers in Canada.

Sawyer-Stoll Acquire Timber Limits

The Sawyer-Stoll Timber Company, Escanaba, Mich., have secured a provincial charter under the name of the Sawyer-Stoll Lumber Company of Canada, Limited, which is a subsidiary of the parent company and acquired extensive timber limits in Addington and Lennox counties in Ontario. The local manager is Wallace I. Johnston, Tweed, Ont. The company will put up a mill early in the spring and expect to employ at least three hundred hands in timber, tie and pulpwood operations. Considerable pulpwood will be taken out by the firm during the coming season.

Porcupines Damage Valuable Timber

Porcupines have been assailed by lumbermen and pulp wood men for the damage caused to valuable timber but the Ontario government is not considering placing a bounty on the animals, according to D. J. Taylor, Toronto, deputy minister of Game and Fisheries. At one time porcupines were protected under game laws as a source of food supply to woodsmen but the protection was removed. The animals are destructive to camps because they are fond of salt. Dishwater also attracts them to camps and they will chew up an axe handle because of the body salt on it. They destroy timber by gnawing a girdle around the trunk of a tree.

Abitibi Steel Tug Launched

A. J. Auden, divisional woods manager of the Abitibi Power and Paper Company, Port Arthur, and R. J. Askin, manager of the Thunder Bay Paper Company, Port Arthur, were at Orient Bay on August 5 where they witnessed the launching of a big new steel tug of the Abitibi Company for service on Lake Nipigon. The tug, the *Nipigon*, is 96 feet long and of all steel construction. It was built at Sorel, Que., by Marine Industries, Limited, and was cut in sections for shipment to Orient Bay where it was re-assembled for the launching.

Import Committee Asks Action

A dutiable value of about 26 cents per pound was held to be correct in the case of twelve importations of waxed candy wrappers, imported in 1935 and 1936. The importers had claimed that the actual selling price of 15 cents was the dutiable value, and appealed to the Courts against the 26 cent valuation. This decision increases the cost to the importer about 2 cents per pound. The Import Committee had asked action for the American Paper Industry because of the competition from Dutch manufacturers.

Chicago Market Reports Better Business

Volume In Practically All Grades of Paper Increases With Prices Reported As Firm—Lower Grades of Waste Paper More Active — S.A.P.I. Trade Customs — E. L. Leonardson Killed By Train — Other News.

[FROM OUR REGULAR CORRESPONDENT]

CHICAGO, Ill., August 15, 1938—While August is developing the usual form of uncertainty following a somewhat unexpected improvement in business sentiment, the local paper trade continues to express optimism over the near future. Volume in virtually all grades is materially up and prices are quoted as firm. Perhaps the only exception reported was in the kraft industry where, though volume is better than for a number of years, there is an alleged hesitancy in the price structure. The reason for this condition is obviously not at all clear according to local reports. Book papers have picked up slightly and the undertone here is firm. Covers have also bettered themselves while groundwoods also are giving a better account of themselves. Sulphites are in good shape with volume upward. The waste paper market is firm.

Lower Grades of Waste Paper More Active

Common grades of waste paper show an increase in the mill purchase price for August though tonnage is not reported as extraordinary in any sense of the word. The advance in mixed papers, which showed a $2 improvement, is better than seasonal and is said to indicate that collections were approaching such a low point as to make higher prices necessary to encourage collections. The demand for waste rags is fair with the prices showing advancement of around $5 a ton according to local reports, the advance indicating better business and also a feeling that higher prices are slated after Labor Day.

Trade Customs of Salesmen's Association

Increasing interest in the establishment of workable Divisional Trade Customs continues to occupy the time of the Salesmen's Association of the Paper Industry. It is reported that the midwest division is giving serious consideration to a complete consolidation of divisional trade customs to be published in book form for the use of mill salesmen and paper merchants throughout the country. J. C. Burruss, president of the Association, was in New York City recently discussing the plan and receiving suggestions of the members of the eastern division.

The Association will enjoy their fourth golf outing of the season at the Park Ridge Country Club on Friday, August 12. The event will be the semi-final tune up event for the final outing to be held at the Olympia Fields Country Club in September in conjunction with the Fall meeting of the National Paper Trade Association.

E. L. Leonardson Killed By Train

The paper local trade was saddened this week by the accidental death of E. L. Leonardson, sales representative of the Nekoosa-Edwards Paper Company and a member of the local salesmens association. Mr. Leonardson and his family planned a vacation trip and Mr. Leonardson had stopped at the police station to suggest that his home be watched during absence from the city. The delay caused him to make an unsuccessful effort to take the suburban train to the city and he was thrown between the cars, dying an hour later. He is survived by a wife and young daughter.

Cleveland Container Leases Building

The Cleveland Container Corporation, manufacturers of paper cartons, cores and tubes for mailing protection, has leased a building at 1428 W. 37th Street, three stories with basement and offering an area of 50,650 square feet of space. The new location affords a 100 foot loading platform and a freight elevator to serve all three floors. W. F. Walker is the company's president and M. D. Joecken, secretary and treasurer of the concern which entered Chicago in 1935 with a 6400 square foot building on Chicago's near southwest side.

Changes in Brown Co. Announced

Further announcements have recently been made concerning changes in the Brown Company necessitated by the retirement from business of Warren Moore who has been manager of this division and identified with the mill for about 37 years. Ben Babbitt is to take over the managership of the division itself while W. L. Gilman will continue as manager of the pulp sales division. The major change reported is in the transferring of the towel division to the New York office.

Paper and Twine Club Meets August 23rd

O. L. Bilz of the Chicago office of Crocker-McElwain Company, is the newest Chicago recruit to the rapidly growing membership of the Paper and Twine Club. The advisory council of the Club, incidentally, is to hold a meeting in Chicago on August 23 to further discuss the basic program of the organization and to consolidate suggestions voiced at a meeting held here on July 26.

Mudge Paper Co. Has Outing

The fourth annual outing of the Mudge Paper Company was held on Saturday, August 6, at the summer home of Herman I. Stermer, secretary of the company, on the Magothy River.

The Washington, D. C., and York, Pennsylvania, Divisions joined with Baltimore in an early start for the lovely retreat, where upon arrival the usual outdoor festivities began.

Varied and delectable food awaited the hungry picnickers who showed their appreciation of it by coming back for more and still more.

Aquatic sports followed until the sun slowly began to sink in the West when it was realized that another successful outing must be brought to a close.

Grateful appreciation was extended to the genial president of the company, E. Tileston Mudge, II, and to the host and hostess of the occasion, Mr. and Mrs. Stermer.

Financial News of Pulp and Paper Industry

Dixie Vortex Reports Net Profit of $812,518 for Year Ending June 30 — Southern Kraft Increased Its 6 Per Cent Notes In July, Making $9,400,000 Outstanding at Close of Month—I. P. Co. Reports Loss of $701,116.

NEW YORK STOCK EXCHANGE

High, Low and Last for the Week Ending August 17, 1938

	High	Low	Last
A. P. W.	3	3	3
Armstrong Cork Co.	43½	41¾	43
Celotex Corp.	23	20	22⅝
Celotex Corp., pf.	68	65	65
Certain-Teed Products Corp.	9½	8⅛	9⅜
Certain-Teed Products Corp., pf.	36⅜	33¼	35
Champion Paper & Fibre Co.	25	23¾	25
Champion Paper & Fibre Co., pf.	97½	97½	97½
Congoleum-Nairn Co.	24⅞	23¼	24
Container Corp. of America	16	14½	15⅜
Continental-Diamond Fibre Co.	9½	9	9
Crown-Zellerbach Co.	13⅝	12¾	12⅞
Flintkote Co.	23	19⅝	21⅛
Robert Gair	4⅞	4⅛	4½
Robert Gair, pf.	15	14	14
International Paper & Power	10½	8¾	9⅛
International Paper & Power, pf.	43½	38¼	39¼
Johns-Manville Corp.	94¾	89	93¼
Johns-Manville Corp., pf.	128	128	128
Kimberly-Clark Corp.	28	27	27
Masonite Corp.	55¾	50½	51½
Mead Corp.	14	12⅛	14
Mead Corp., pf.	69½	66	67½
Paraffine Companies, Inc.	46	46	46
Ruberoid Co.	27	25	26
Scott Paper Co.	46¾	46⅛	46¾
Sutherland Paper Co.	28¾	27½	28¼
Union Bag & Paper Corp.	14⅛	13	13⅜
United Paperboard Co.	7½	6¾	6¾
U. S. Gypsum Co.	90¼	85¼	89½
U. S. Gypsum Co., pf.	169⅞	169⅞	169⅞

NEW YORK CURB EXCHANGE

High, Low and Last for the Week Ending August 17, 1938

	High	Low	Last
American Box Board Co.	9⅛	9⅛	9⅛
Brown Co., pf.	25	24½	24½
Great Northern Paper	29	28¼	29
St. Regis Paper Co.	3⅜	3⅛	3⅛
St. Regis Paper Co., pf.	57	55	57
Taggart Corp.	5¾	5½	5½

Dixie Vortex Earns $812,518

For the 12 months ended June 30, 1938, consolidated net profits of the Dixie-Vortex Company, per books and not audited, were $812,518.74. After allowing for regular dividends of $2.50 per share on the Class A stock, this was equivalent to $1.80 per share on the outstanding common stock. In comparison, consolidated net profits for the 12 months ended June 30, 1937, were $910,488.06, equivalent to $2.29 per share of common stock.

"Our company, like most others, has felt the effect of the business depression. Weather conditions prevailing throughout the country during May, June and July have been unfavorable to the consumption of our products. This has all resulted in lower sales and profits. While expenses have been curtailed materially and overheads reduced, other items beyond our control, like taxes, have continued relatively upward," R. C. Fenner, president, said.

Southern Kraft Increases Notes

The Southern Kraft Corporation increased its 6 per cent notes by $200,000 in July, making $9,400,000 outstanding at the close of the month. The notes were issued to International Paper Company and pledged with banks which advanced funds for capital expenditures in connection with construction of Southern Kraft's new mills.

The Scott Paper Company reports for the six months ending July 2, 1938, net earnings for the common stock of $743,628, equal to $1.30 a share. This is an increase of 21 per cent over the earnings of $613,826, or $1.07 a share, reported in the first half of 1937.

Net sales for the same 1938 period were $8,282,805, a gain of 19 per cent over the first six months of last year.

Dividends at the rate of $.80 per share totaling $455,988 were paid on the Common Stock in the first half of 1938, compared with $.65 per share totaling $370,488 in the like 1937 period.

The statement for the period ending July 2, 1938 is based on a closing of the accounts at that date, and conforms to a statement prepared by accountants and included in a Registration statement filed with the S.E.C. on August 3, 1938. Closing the accounts as at that date resulted in the inclusion in earnings of certain reserves computed by the management on the basis of annual estimates or budgets for certain materials and expenses, pursuant to the policy of the company in the preparation of interim financial statements.

Swedish Wood Pulp Makes Good Report

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., August 10, 1938—Net profits of the Swedish Chemical Wood Pulp Corporation for 1937 were reported at 3,697,970 Crowns for the previous calendar year, according to reports from the office of the American Commercial Attache, Stockholm. This surplus remained after writing off one million Crowns on the Ostrand mill and transferring 520,000 Crowns to the tax reserve.

Output of the mills owned by the corporation now amounts to nearly 700,000 metric tons of chemical wood pulp, 210,000 metric tons of mechanical pulp and 190,000 standards of lumber.

Cancels Reorganization Proceedings

PROVIDENCE, R. I., August 15, 1938—The Union Paper Company of Providence, which some months ago was given permission to reorganize under Section 77B of the bankruptcy laws, last week cancelled the proceedings with the approval of Federal Judge John C. Mahoney. A motion for cancellation said a plan for payment of debts, satisfactory to creditors, had been worked out and re-organization was no longer necessary.

Ward Paper Co. Resume Production

[FROM OUR REGULAR CORRESPONDENT]

MERRILL, Wis., August 15, 1938—Production is to be resumed by the Ward Paper Company this week, according to announcement of D. B. Smith, recently appointed secretary-treasurer and general manager.

"The present plan of operation is that the mill will start up on approximately August 15th, manufacturing bleached specialties and papers for conversion purposes," said Mr. Smith. "During the period that the mill was shut down there have been extensive improvements and alterations, and we contemplate very little difficulty in getting into full production."

The company recently was granted an RFC loan of $250,000 which will be used for working capital rather than for new equipment.

I. P. Reports $701,116 Loss

Richard J. Cullen, president, in submitting to stockholders under date of August 15, the statement of consolidated profit and loss of the International Paper and Power Company and subsidiaries (excluding International Hydro-Electric System and its subsidiaries) included also revised figures for the quarter ending March 31, 1938, as well as figures for the quarter and six months ended June 30, 1938, and for the six months ended June 30, 1937.

The consolidated net loss for the six months ended June 30, 1938, amounted to $701,116 as compared to the consolidated net profit of $5,032,693 for the six months ended June 30, 1937.

All the 1938 figures exclude the operating results of International Power and Paper Company of Newfoundland, Limited, all common shares of which are being sold to Bowater's Paper Mills, Limited, the leading newsprint producer in Great Britain, for the sum of $5,500,000. Further details with respect to this sale and the effect on the consolidated accounts of International Paper and Power Company are included in the statements shown below:

Heads Crown-Zellerbach Corp.

J. D. Zellerbach, heretofore executive vice-president of the Crown Zellerbach Corporation, San Francisco, Cal., has been elected president of the company, succeeding I. Zellerbach, who has occupied that office since the organization of the company and who will become chairman of the executive committee. R. A. McDonald and H. L. Zellerbach, previously vice-presidents of the corporation, have been elected executive vice-presidents, effective at once; F. N. Youngman, vice-president of Pacific Mills, Ltd., Ocean Falls, B. C., an affiliated interest, has been elected vice-president of the Crown Zellerbach Corporation.

Provincial to Redeem Bonds

[FROM OUR REGULAR CORRESPONDENT]

TORONTO, Ont., August 16, 1938—Provincial Paper, Limited, Toronto, have given notice of the redemption on November 1st next of $500,000 of outstanding twenty year, first mortgage, five and a half per cent, sinking fund bonds, Series "A". The payment of the redemption price is the principal of the bonds to be redeemed, together with a premium of one and one half per cent thereon, along with the accrued and unpaid interest on the principal to November 1st, 1938.

INTERNATIONAL PAPER *and* POWER COMPANY AND SUBSIDIARY COMPANIES

(Excluding International Hydro-Electric System and Subsidiaries)

Statement of Consolidated Profit and Loss

	Three Months Ended March 31, 1938	Three Months Ended June 30, 1938	Six Months Ended June 30, 1938	Six Months Ended June 30, 1937
SALES AND OTHER INCOME:				
Gross sales, less returns, allowances and discounts	$22,647,353.71	$22,557,434.20	$45,204,787.91	$63,034,616.36
Other income—net	251,931.75	231,272.64	483,204.39	664,605.28
	$22,899,285.46	$22,788,706.84	$45,687,992.30	$63,699,221.64
COST AND EXPENSES:				
Cost of sales:				
Pulpwood, labor, materials, etc.	$14,321,547.92	$14,549,784.97	$28,871,332.89	$36,720,931.30
Maintenance and repairs	1,445,781.24	1,341,401.35	2,787,182.59	3,643,604.08
Taxes (other than income taxes)	643,871.05	674,305.63	1,318,176.68	1,292,449.33
Outward freight and delivery expenses	2,666,577.89	2,810,054.20	5,476,632.09	7,317,811.65
Selling, general and administrative expenses	1,335,376.71	1,385,909.86	2,721,286.57	2,904,065.94
Provision for doubtful accounts	152,162.05	152,756.91	304,918.96	305,092.90
	20,565,316.86	20,914,212.92	41,479,529.78	52,183,955.20
	$2,333,968.60	$1,874,493.92	$4,208,462.52	$11,515,266.44
DEDUCTIONS:				
Interest on funded debt	$882,657.60	$910,320.22	$1,792,977.82	$2,037,502.22
Interest on other debt	2,391.96	6,110.37	8,502.33	4,810.50
Amortization of debt discount and expense	97,351.68	96,617.39	193,969.07	206,332.80
Depreciation	1,063,450.22	1,089,643.50	2,153,093.72	2,094,763.19
Depletion	179,615.70	241,100.37	420,716.07	584,428.21
Provision for income taxes	214,958.00	88,849.57	303,807.57	1,500,911.70
Provision for Federal undistributed profits tax	.....	.....	.....	.....
Dividends accrued but not being currently paid on preferred stocks of subsidiaries	18,478.25	18,033.25	36,511.50	53,824.61
NET *LOSS* OR PROFIT	2,458,903.41	2,450,674.67	4,909,578.08	6,482,573.23
	*$124,934.81**	*$567,180.75**	*$701,115.56**	$5,032,693.21

In the above consolidated financial statements foreign accounts are stated on the basis of $4.85 for the pound sterling and at parity of exchange for Canadian and Newfoundland currencies without adjustment of differences. It is the practice of the companies to reflect in current operations any differences between these rates and the current quotations at the time funds are actually transferred or forward commitment contracts are settled.

Undeclared cumulative dividends on the cumulative convertible 5% preferred stock of International Paper and Power Company at June 30, 1938 amount to $4,628,515.00 ($5.00 per share).

The above statements are subject to final adjustment at December 31st (end of fiscal year).

* The operating results of International Power and Paper Company of Newfoundland, Limited, for the first two quarters of 1938 have been excluded from the foregoing statement. An agreement was made on June 2, 1938 providing for the sale of all the Common shares of the Newfoundland Company to Bowater's Paper Mills, Limited. Under the terms of this agreement, International Paper and Power Company and subsidiary companies have no equity in the profit or loss resulting from the operations of the Newfoundland Company subsequent to December 31, 1937. The above net loss of $124,934.81 for the three months ended March 31, 1938 is after excluding the results of the Newfoundland Company whereas the previous quarterly report for the three months ended March 31, 1938, issued under date of May 10, 1938, showed a net loss of $332,241.29 including the operating results of the Newfoundland Company. The selling price of the Common shares of the Newfoundland Company was $5,500,000 which is $349,873.91 less than the amount of the net worth of the Newfoundland Company carried in the consolidated financial statements at December 31, 1937, and this difference has been charged against consolidated earned surplus as of June 30, 1938.

Mill Visits to Feature TAPPI Fall Meeting

Among paper makers, paper dealers and their associates, Green Bay is prominent as an industrial community which produces more absorbent paper of a personal-use nature than any other community in the United States, if not the world.

Green Bay has three large self-contained mills and four converting plants. These producers of pulp and paper items ship their products to all corners of the United States as well as to all other countries throughout the world. An opportunity to see the Green Bay mills will be provided for members of the Technical Association of The Pulp and Paper Industry who attend the fall convention at Green Bay, Wis. September 8-10, 1938.

Naturally, with so much paper and pulp manufacturing activity centered at one point, Green Bay mills and converters offer visiting TAPPI members a chance to see varied processes in the manufacturing of diversified paper and pulp items, plus a wide array of modern mill equipment and paper making machinery. Transportation facilities will be available for visits to local mills, as well as other mills in nearby communities.

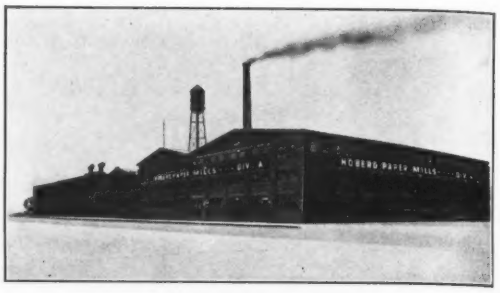
Industry and commerce have thrived in Green Bay. Located where Great Lakes shipping meets inland canal travel, and with three great rail systems, Green Bay enjoys the advantage of proximity of raw material and ready and cheap access to markets. Green Bay is "The Gateway to the Great Water Way"—a city of inexhaustible supplies of hydro-electric and turbine generated electric power, and a city peopled by competent, prosperous and contented workmen.

Paper Production

Approximately two thirds of the tissue paper output of the entire world is produced by Green Bay mills and converting plants. In the neighborhood of 300 tons of tissue are made daily by Hoberg Paper Mills, Northern Paper Mills and Fort Howard Paper Company. Carloadings of finished products last season totaled 5056. The annual payrolls of the paper industry in Green Bay reached $2,500,000 in 1937, producing about 30% of all business activity in the city.

One of the first paper mills west of the Alleghenies

NORTHERN PAPER MILLS



HOBERG PAPER MILLS

was founded in Green Bay by the late John Hoberg. This was in 1892 and led to a concentration of paper making in the city of Green Bay and the adjoining Fox River Valley area.

Green Bay paper mills are favored with Great Lakes and ocean transportation. Coal, pulpwood, sulphur and other raw materials can be unloaded at docks adjacent to all mills. These dock and shipping facilities should be of especial interest to visiting TAPPI members. A centralized pulpwood dock is located in the city where incoming boatloads of pulp are received and redistributed to mills located on the lower part of the Fox River.

If you are interested in figures you have undoubtedly noticed in market reports for the past year that Green Bay is one of the "white spots" on the better business map for the country. A great measure of this local prosperity can be attributed to local paper mills and converters who have been so successful in the manufacture, sale and distribution of the products they make.

Train connections out of Chicago for Green Bay on two lines can be made as follows:

Chicago & North Western—sleeping cars ready for occupancy at 9:30 P.M. standard time will be provided on train No. 117 leaving Chicago at 1:50 A.M. arriving Green Bay 8:00 A.M. the next morning.

Chicago, Milwaukee, St. Paul & Pacific—Chippewa leaves Chicago 1:01 P.M. arriving Green Bay 4:47 P.M. The Copper Country Limited leaves Chicago at 5:05 P.M. arriving Green Bay at 10:10 P.M. No. 19 leaves Chicago 7:25 P.M. and arrives Green Bay 11:59 P.M.

On either railroad the coach fare is $3.95, round trip $7.55. First class fares are $5.92 one way and $8.90 round trip. Parlor car chairs are 85 cents one way. Lower berths are $2.10 and upper berth $1.60.

Machine Operation Recorders

A modern installation of Bristol's Machine-Operation Recorders is illustrated in a new bulletin recently published by The Bristol Company, Waterbury, Conn. Some of the helpful information for the manufacturer provided for by these instruments is indicated by the following: cutting or running time of the machine, delay time, idle time, set-up or make-ready time, quantity and rate of production. A copy of Bulletin No. 510 may be obtained upon request.

Constant Tension Web Control

By R. Mc C. Johnstone[1]

The use of high speed automatic machinery for slitting, wrapping, packaging, printing, etc., has necessitated a greatly increased use of web material in the form of rolls. In all stages of such processing of material, whether it be paper, fabric or cardboard, practically every process may be broken down into three operations, that is, unwinding, processing and rewinding. When the vital relationship between the proper functioning of these three operations is carefully considered by anyone familiar with the processing, printing or slitting of paper or fabric, one is struck by the high development that has been reached in the manufacture of machines for processing, slitting and rewinding, and on the other hand, by the almost negligible development in unwinding equipment which has been made during the last thirty years. From this angle one cannot but be impressed by the fact that the quality of work produced by such equipment must be measurably affected by the service which the unwinding equipment is able to render. It is therefore logical to review the development of existing unwinding equipment and to discuss the service desired therefrom.

At the Turn of the Century

At the turn of the century, mill roll unwinding and braking equipment in general consisted of two stands with adjustable "U" slot bearings to carry the mill roll shaft and permit it to rotate, and a flat faced pulley on one end of the mill roll shaft either directly mounted or coupled by means of a sliding coupling, a flat band friction being wrapped around the face of the pulley with various designs for anchoring and usually fitted with a handwheel and screw for tightening the brake. The lining of the brake band consisted of almost anything; sometimes wornout paper-machine clothing—sometimes woven asbestos—quite often wooden blocks.

With such equipment it was impossible for the machine operator to know definitely exactly how much tension was being applied to the web. It was also necessary continually to adjust the brake for changing conditions. For instance, when starting to unwind, it was necessary to release the brake tension in order to compensate for the inertia of the mill roll and the standing friction of the mill roll shaft and its bearings. Otherwise, when starting the processing machine or winder the sheet would be snapped off. But after the winder started it was necessary immediately to increase the friction on the brake, the successful operation of the processing machine requiring that the operator make continual adjustments on the brake as the diameter of the mill roll decreased. This meant that the operator was not able to devote all of his time to the work on hand, but was continually having to pay attention to the unwinding to be sure that he was running the web with neither too much nor too little friction on the brake. The above condition meant a loss of power due to the excess braking effort required, also a large loss in production due to the operator being distracted by the necessity of having to bother with brake adjustments, and, in general, the atmosphere near an unwinding stand was marked by a cloud of pungent smoke.

At a later date brakes were developed changing the plain pulley type to a hollow pulley having circulating water in it. This water cooling, of course, produced an improvement in the operating conditions, but did not overcome the major objections.

About 1930 some mills secured a measurable amount of control over the tension on their mill roll

[1] Vice-Pres. Cameron Machine Co.

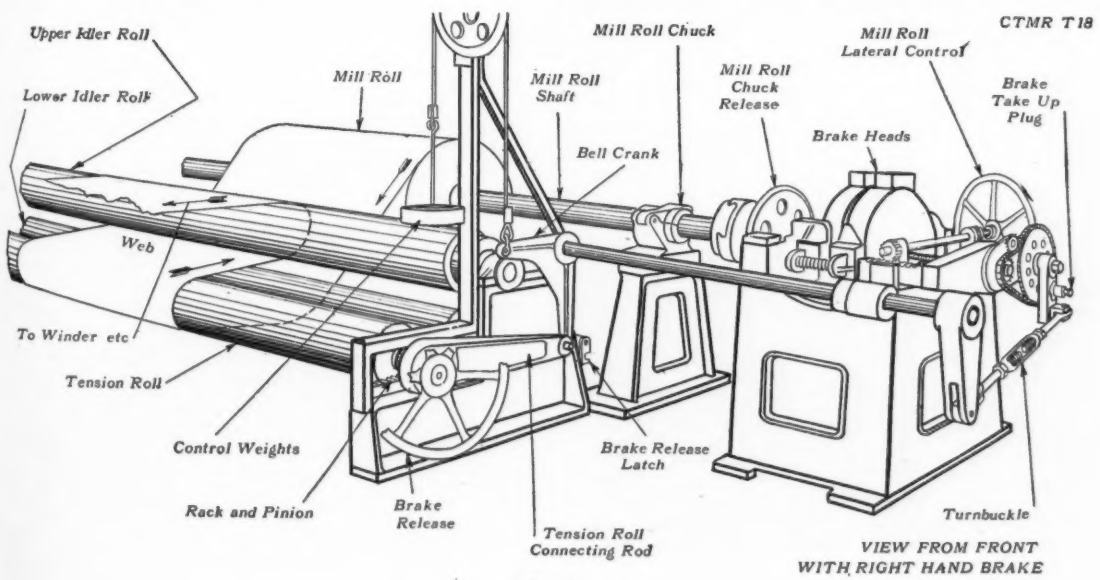


FIG. 1.

equipment by placing an ammeter in the drive motor circuit of the processing machine or winder, the operator then endeavoring to manually adjust the brake friction so as to maintain a constant reading on the ammeter. This, of course, gave the operator a fixed standard to shoot at, but did not relieve him of any of the effort of continual manual adjustment of the brake friction.

During most of the last thirty years there have been repeated attempts to develop a mill roll brake which would operate to produce a constant tension on the web without continual manual adjustment on the part of the operator, and the balance of this article will be confined to a description of the operation and mechanism of unwinding equipment as developed by Cameron Machine Company of Brooklyn, N. Y.

The constant tension mill roll equipment was designed to specifications. The first specification was that the tension adjustment on the mill roll must be in some visible or easily comprehended form. The answer was the use of various sized and varying quantities of weights on the counterbalance mechanism so that if an operator found it desirable to run a web under a different tension he would use the equivalent amount of weight on his counterweights and if it was desired to increase this tension by say 10 or 50 lbs., it would mean either the addition of 10 or 50 lbs. more weight on the counterbalance.

It was also specified that once this weight adjustment was made it should not be necessary to make any further changes in the tension adjustment in order to maintain the same tension on the web regardless of inertia of the mill roll, the shaft or the brake, or the standing friction of the parts when starting up the machine. The web tension was also to be maintained constant during acceleration or deceleration. All these desired features have been secured in the new constant tension mill roll design.

What the Illustrations Show

Referring to the illustrations, Fig. 1 illustrates a Type 18 heavy duty constant tension mill roll equipment suitable for use behind paper machines or large rewinders. It is built in widths from 92 to 162 inches. A heavier design is available in widths from 142 to 262 inches, being known as the Type 20 constant tension mill roll. The sizes of the above equipments vary in intervals of 5 inches. Both of the above

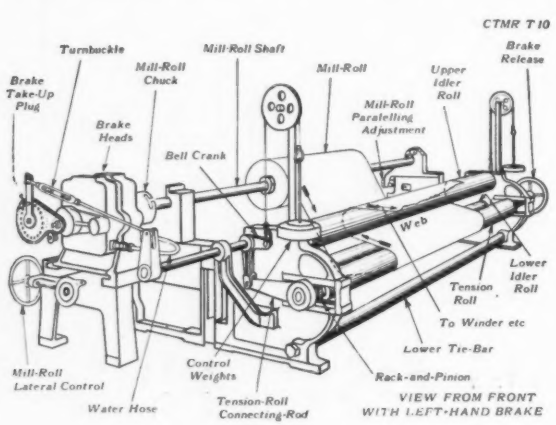


FIG. 2.

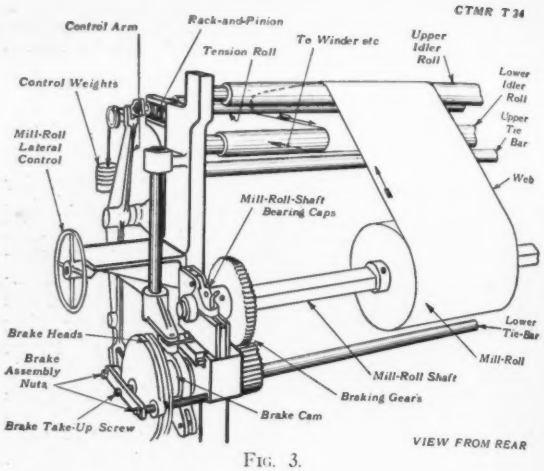


FIG. 3.

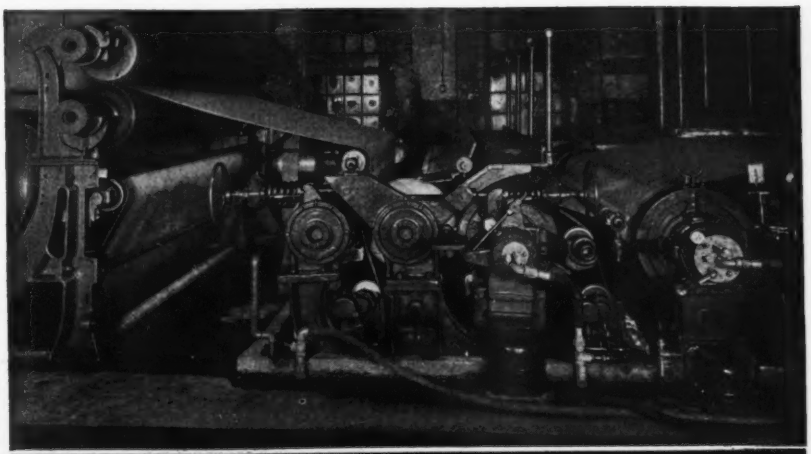
types are provided with a water cooled disc type brake.

Illustration Fig. 2 is a Type 10 constant tension mill roll equipment suitable for use on narrow paper machines or on finishing room winders, printing presses, waxing machines, or other processing machines. It is built in widths from 42 to 102 inches in 10-inch intervals and will operate at speeds ranging up to 2000 f.p.m. A water cooled disc type brake is also a standard part of this equipment.

Illustration Fig. 3 is a Type 24 constant tension mill roll equipment which is built in widths of 26, 32, 42 and 50 inches and will operate at speeds ranging up to 600 f.p.m. It is intended for use with light and medium duty slitting machines, etc. A disc type brake is furnished but it is not water cooled.

Description of the Operation

A description of the operation of the above equipments may be had by referring to illustrations Fig. 1, 2 and 3, and the parts referred to in italics in this description will refer to parts with similar names on the illustrations. The desired tension of the web is obtained by means of *control weights*. These *control weights* cause the *tension roll* to assume a forward position on the equipment and also, by means of the cranks and linkages illustrated, cause application of high pressures to the braking equipment. If the *mill roll* were standing still and power applied to the slitter, the web would advance toward the slitter, but as this web is wrapped around the *tension roll* the tension on the web would be equal to the forward pull of the *tension roll*, therefore, as the *mill roll* is standing still, the freely rotating *tension roll* would be drawn backward in its guides. This would cause a reduction in the braking effort to a point where the braking would be sufficiently reduced to permit the *mill roll* to rotate. It will thus be seen that the pull of the web on the *tension roll* is constantly balanced by the braking effort of the water cooled *brake heads* on the friction disc which rotates between them, so that if, for some reason, the braking effort fell below the required amount, the *tension roll* would advance and apply the necessary amount of braking effort to maintain the balance between web tension and braking effort. This cycle, of course, functions entirely independent of speed, acceleration or deceleration, and also is independent



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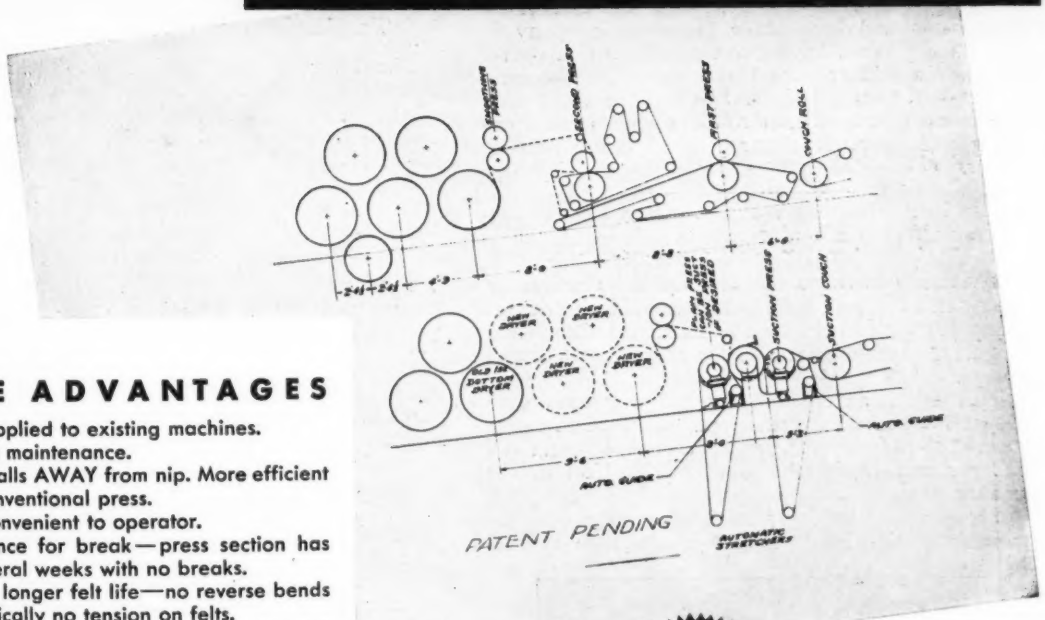

SOME ADVANTAGES

1 Easily applied to existing machines.
2 Reduces maintenance.
3 Water falls AWAY from nip. More efficient than conventional press.
4 More convenient to operator.
5 No chance for break—press section has run several weeks with no breaks.
6 Assures longer felt life—no reverse bends—practically no tension on felts.
7 Shorter felt length without decreasing felt life.
8 Reduces stretch in sheet.
9 Unnecessary to carry a large amount of crown.
10 Paper goes to dryers more bone dry.
11 Saves enough space to permit use of more dryers, or to lengthen fourdrinier wire part.
12 Eliminates crushes.
13 Smooths out sheet without need of reverse press.
14 Increases speed and safety.

Many other advantages. Write for details.

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Attend TAPPI Convention, Green Bay, Wisc., Sept. 8-9-10

of the change in diameter of the roll of paper or fabric which is being unwound, the position of the *tension roll* being determined solely by the tension on the web and not by the diameter of the unwinding roll on the mill roll shaft.

It may be timely to state at this point that the earliest models of these constant tension unwinding equipments were put to an extremely severe test on multi-color printing presses. On these equipments lengthwise register was maintained irrespective of press speeds or diameter of the mill roll without any attention by the pressman after the desired tension had once been set. These equipments have also proven very successful on coating machines and waxing machines in which it was desired to secure a uniform coating not obtainable on existing equipments. Of course, the largest field for the constant tension mill roll stand is in conjunction with paper slitting and roll winding machines.

Permits Rapid Replacement

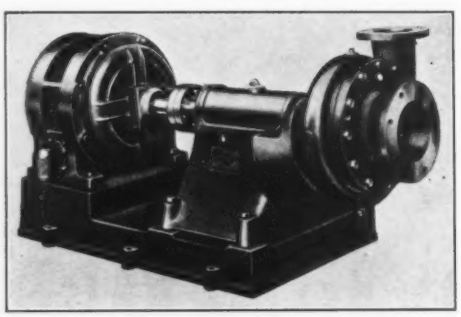
The design of this equipment permits replacement of the brake disc in less than two minutes. However, a checkup on replacements in one mill which has 23 of these constant tension mill roll stands in operation, brought the reply that in the two years they have been in operation there have been no replacements, an inspection also showing that there was very little wear on the friction linings. Another mill, using six water cooled brakes over a period of three years, also stated that no replacements had been made. Another company in the Middle West, having five equipments in operation for a similar period also showed no replacements on the brake linings. In all of the above mills the constant tension mill roll equipments are operating at high production speeds on heavy rolls of paper.

New Lawrence Centrifugal Pump

The accompanying actual illustration illustrates the type "HBD" single stage, side suction centrifugal pump just announced by the Lawrence Pump and Engine Company, makers of the Lawrence "Vortex" pumps.

This unit is an especially rugged and heavy duty design for general industrial pumping. Sizes range from 1½-18 inch discharge; capacities from 10 gal. per min.-15,000; heads up to 300 feet in the smaller sizes.

The pump casing is of solid volute type with removable suction head. Eccentric nozzle on suction head permits removal without disturbing discharge pipe or pump alignment and eliminates air pockets.



NEW CENTRIFUGAL PUMP

The impeller is enclosed type, cast in one piece, balanced and locked on shaft by long key and non-rust impeller nut.

The supporting bracket and pump casing are separate parts with machined male-female fit between to insure perfect alignment. As a further precaution to give accurate alignment the male-female joint and bearing seats on supporting bracket are machined in one operation.

There is a close grained cast iron standard for pump casing. The fact that the pump casing and bracket are separate parts permits the casing to be furnished inexpensively in special alloys for handling corrosive liquids. The impeller is of cast iron, bronze, or special alloy when specified.

Two heavy duty, double row ball bearings, lubricated by an oil reservoir, and entirely external from pump, support the shaft. The bearing nearest the pump carries radial load only and is self-aligning. The outer bearing of angular contact type carries thrust and radial loads.

The packing gland is of bronze and is of the split, two-piece interlocking type that may be easily and completely removed when packing the stuffing box.

A complete description of the type "HBD" Lawrence "Vortex" pump is given in Bulletin D-48, which may be obtained by writing to Lawrence Pump and Engine Company, P. O. Box 70, Lawrence, Mass.

To Confer on Industrial Statistics

The Massachusetts Institute of Technology announces a two-day conference, under the direction of the Department of Mathematics and the Department of Economics and Social Science, on the application of statistical methods to industrial and engineering problems. Addresses and discussions by visiting industrial statisticians and Technology staff statisticians will include a résumé of certain statistical technique needed for effective handling of industrial data, successful applications of statistical methods in the fields of engineering and quality control, contemporary developments in industrial and engineering statistics. The practical applications of statistical methods in engineering and industrial work have developed steadily in the last ten years, and it is the purpose of this conference to explain to American engineers and executives the nature and possibilities of certain of these cost-saving statistical devices.

Among those who will address the conference are L. H. C. Tippett, British Cotton Industry Research Association; Dr. Walter A. Shewhart, Bell Telephone Laboratories; and Dr. S. S. Wilks, Professor of Statistics, Princeton University.

There will be five sessions: Thursday, September 8, at 9 A.M., 2 P.M., and an informal dinner meeting at 7 P.M.; Friday, September 9, at 10 A.M. and 2 P.M.

Registration fee, including all meetings except the dinner meeting, is $3.00. The Thursday dinner meeting fee is $1.50. There are no other charges. Fees are payable at the first meeting.

The evening of Friday, September 9, will be devoted to applications of statistical methods in the fields of biology and medicine.

All correspondence should be addressed to the Secretary, Conference on Engineering and Industrial Statistics, Massachusetts Institute of Technology, Cambridge, Mass.

Obituary

Nelson R. Caswell

[FROM OUR REGULAR CORRESPONDENT]

GOUVERNEUR, N. Y., Aug. 13, 1938—Nelson R. Caswell, 73 years old, organizer and president of the defunct Aldrich Paper Company, died at his home here this week following a brief illness. He was prominent in the paper manufacturing industry of northern New York for many years besides being associated with many other enterprises. He started his career as a bookkeeper with the Remington Paper Company which owned mills at Brownville and Dexter. After a few years he was made treasurer and he held that position until the properties were sold to the International Paper Company in 1898. In 1900 the Aldrich Paper Company was formed by Mr. Caswell and Samuel Child. The former was treasurer and had supervision of practically all the details of building the paper mill of the concern at Natural Dam. When the Aldrich mill was destroyed by fire in 1920, a new company, the Oswegatchie Paper Company was organized and the mill was rebuilt and reopened in 1923. After running for several years the mill was closed in 1929.

Following the closing, Mr. Caswell served as a member of the mortgage bondholders' protective committee of the company and it was mainly through his efforts that the mill was sold in 1935 to the Rushmore Paper Mills, present owners of the plant at Natural Dam. In 1918 he was elected president of the First National Bank, of this place, and he was also a former director of the Jefferson County National Bank. In addition to his activities in the paper industry he was also associated with mining and lumber interests. The principal survivors are his wife, two sons and a daughter.

Walter Metcalf

[FROM OUR REGULAR CORRESPONDENT]

HUDSON FALLS, N. Y., Aug. 13, 1938—Walter Metcalf, for many years superintendent of the Union Bag & Paper Company, died early today at a hospital in Schenectady. He was superintendent at both the Fenimore and Allen paper mill plants a number of years ago and from here he went to Vermont. His widow is the principal survivor.

Mrs. Flora B. Reed

Mrs. Flora B. Reed, wife of Edward E. Reed, president of the Reed Tissues Corporation, Little Falls, N. Y., died suddenly on August 6 at her home in Little Falls. She was thought to be recovering from an operation performed in June but was seized with a heart attack. Mrs. Reed was born in Newark, N. J., the daughter of Isaac and Sarah Monque Blanchard and was married to Mr. Reed in that city, coming to reside in Little Falls in 1933.

Mrs. Reed was active in the Methodist Church, was a teacher of the Mizpah class and served on the board of trustees of the Women's Christian Association. She was treasurer of the Ladies' Aid Society of the Park Avenue Methodist Church, East Orange, N. J. for 28 years. During the World War she engaged in Red Cross work, supervising 100 workers in that organization. While a resident of East Orange, she was prominent in the activities of the Parent Teachers' Association.

Surviving are her husband, two sons, two daughters and nine grandchildren. Funeral services were private and burial was in Fairmount cemetery, Newark, N. J.

Must Desist From Unfair Competition

The Federal Trade Commission has entered an order directing Letellier-Phillips Paper Company, Inc., 617 South Front street, New Orleans, to cease and desist from certain unfair methods of competition, the effect of which has been to monopolize in the company the business of buying and selling waste paper, rags and other waste materials in Southern States.

For many years the respondent company has had dominant control of the waste paper business in the South and Southwest generally and in Louisiana, Texas and Mississippi particularly, the Commission found. As a result of this control, according to findings, large consumers of waste materials in these sections are dependent to a large degree upon the respondent company for their requirements, while other and smaller dealers must rely upon the same company as an outlet for their supplies of such products.

The use of the following practices for the purpose, and with the tendency or effect, of creating and maintaining in the respondent a monopoly in the trade territory in which it operates are prohibited by the order:

(1) Intimidating or boycotting, or attempting to intimidate or boycott, competitors because they buy from or sell to certain other competitors of the respondent company.

(2) Threatening to discontinue, or discontinuing, business relations with waste material dealers because they purchase from or sell to certain competitors of the respondent company.

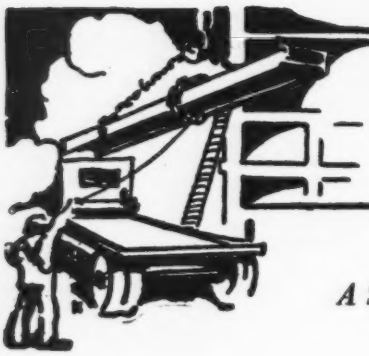
(3) Threatening to discontinue, or discontinuing, business relations with mills and other large consumers because they purchase from certain of the respondent company's competitors.

(4) Threatening to enter the trade territory of other dealers in waste materials located in various States, with whom it is not in direct competition, if they purchase from or sell to certain of the respondent company's competitors.

The tendency and effect of the respondent company's acts and practices, the Commission found, have been to unreasonably lessen and suppress competition in the waste material industry; to deprive the purchasing and consuming public of the advantages they would receive under conditions of normal and unobstructed competition, and to otherwise operate as a restraint of trade.

Fourdrinier Improvements

In a folder just issued by The Black-Clawson Company, Hamilton, Ohio, under the title of "Five Big Improvements For Fourdriniers", the company graphically points out how older machines may be made more efficient a step at a time. The five-point plan includes (1) more simplified flow box design (2) more effective formation table (3) multisectional table roll section (4) non-corrosive materials and lighter but stronger construction, with (5) all controls on the outside and more accessible.



CONSTRUCTION NEWS

A Summary of Vital Facts Regarding Construction, Financing and Operation of Pulp and Paper Mills

General Construction News

Nitro, W. Va.—The American Viscose Corporation, 200 Madison avenue, New York, manufacturer of viscose rayon products, has approved plans for large addition to branch mill at Nitro, to be used for the production of staple fiber, designed to double present mill capacity, now rated at 20,000,000 pounds per annum, effecting a total output of 40,000,000 pounds. Work will comprise several main and auxiliary one-story units, reported to cost in excess of $1,000,000, with equipment. It is expected to begin erection at early date and to have new structures completed during the coming year. Facilities will be provided for about 200 additional employees. W. A. B. Vivian is manager at the Nitro mill.

Chester, Pa.—In connection with expansion program of the Scott Paper Company, manufacturer of tissue paper, recently referred to in these columns, company will install new equipment to increase present capacity about 16 per cent. Contract for buildings and machinery are scheduled to be awarded at early date, with completion of extensions scheduled for March 1939. With its financing for the project through the sale of 30,000 shares of preferred stock, the company also will provide for the purchase of additional capital stock of the Brunswick Pulp and Paper Company, Brunswick, Ga., in which it now holds a substantial interest with the Mead Corporation, Chillicothe, Ohio. Edward S. Wagner, first vice-president and treasurer of the Scott company, is vice-president and treasurer of the Brunswick Pulp and Paper Company.

Detroit, Mich.—The Yankee Fiber Tile Manufacturing Company has been organized with capital of $110,000, to take over and operate company of the same name, with local plant at 51 Selden street for the manufacture of pressed fiber products.

Brooklyn, N. Y.—Shampain, Citron, Clark, Inc., 43 York street, manufacturer of stiff paper boxes and containers, has leased the industrial building at 47-49 Bergen street, and will improve and equip for expansion. Company will take possession of property at once.

Hillside, N. J.—The Mundet Cork Corporation, 501 Bloy street, Hillside, near Newark, manufacturer of insulation products, linings and kindred specialties, has plans maturing for new addition to local plant, to be one-story, estimated to cost over $80,000, with equipment. A building permit has been issued and work is scheduled to begin at early date. Main offices of company are at 65 South Eleventh street, Brooklyn, N. Y.

New York, N. Y.—The Celanese Corporation of America, Inc., 180 Madison avenue, manufacturer of cellulose rayon products, has leased space in local building at 521-31 West Forty-third street, extending through to 522-32 West Forty-fourth street, totaling about 20,000 square feet of floor space, and will occupy for new local storage and distributing headquarters. Present distributing plant at 104-112 East Twenty-fifth street will be removed to new location and capacity increased.

Jarratt, Va.—The Johns-Manville Corporation, 22 East 40th street, New York, N. Y., manufacturer of insulating board, roofing products, etc., has superstructure under way for main mill units at new plant at Jarratt, as well as foundations for certain equipment to be installed. As previously noted in these columns, new mill will be used for the production of insulating board from wood pulp and work on barking drum unit is well advanced. Also, brick work for the one-story dryer building, 240 x 500 feet; wood pulp mill, 240 x 240 feet; and main production and finishing structure, 240 x 520 feet. New plant will represent an investment of about $1,000,000 and will be ready for service early in 1939. The Consolidated Engineering Company, 20 East Franklin street, Baltimore, Md., is general contractor for erection. The Stone & Webster Engineering Corporation, 40 Federal street, Boston, Mass., is consulting engineer.

Quebec, Que.—The Anglo-Canadian Pulp and Paper Mills, Ltd., Quebec, manufacturer of newsprint, plans early rebuilding of portion of local mill on North side of city, recently damaged by fire with loss reported close to $50,000, with equipment.

Wellington, New Zealand—The Whakatane Paper Mills, Ltd., which recently began the erection of several new buildings for pulp and paper mill, employing about 250 workers in construction, is curtailing further work on the structures at the present time and has released close to 200 employes of the quota noted. It is proposed to proceed with the erection with remaining force on a much longer time basis for ultimate completion.

London, England—Celotex, Ltd., a subsidiary of the Celotex Corporation, 919 North Michigan avenue, Chicago, Ill., manufacturer of wall board, insulating board and kindred products, is now operating at its new mill at Stonebridge Park, Middlesex, vicinity of London, recently completed at a cost of about $1,250,000. Initial production has been given over to cane fiber hard board and insulation board, and large capacity is being developed for these specialties. Additional machinery is to be installed for

the manufacture of other Celotex products, including tex-board, tile board and allied materials, as produced at the mills of parent company in the United States.

Tokyo, Japan—The Cellophane Sales Company of Japan, Tokyo, comprising a number of producers of cellophane products in that country, is arranging plans for dissolution, following the withdrawal of one of the leading producers from the organization. With the abandonment of this joint sales company, it is expected that different member companies will develop production at mills without restriction; the organization in the past has exercised a margin-control over output.

Government Paper Bids

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., August 17, 1938—The Government Printing Office has received the following bids for 77,000 pounds (1,000,000 sheets) of 24 x 38 M. F. book paper; Butler Company, 5.76 cents; Paper Corporation of U. S., 5.4 cents; R. P. Andrews Paper Company, 5.39 cents; Marquette Paper Company, 5.44 cents; Barton, Duer & Koch Paper Company, 5.39 cents; Stanford Paper Company, 5.39 cents; Fitchburg Paper Company, 5.4 cents; Old Dominion Paper Company, 5.39 cents; Walker, Goulard Plehn Company, 5.53 cents; Perkins-Goodwin Company, 5.39 cents; Whitaker Paper Company, 5.39 cents; and John F. Post, Inc., 5.39 cents.

For 5,000 pounds of No. 1 gummed kraft paper; Cauthorne Paper Company, 8.28 cents; Andrews Paper House of York, 8.15 cents; Barton, Duer & Koch Paper Company, 8.48 cents; Stanford Paper Company, 14.575 cents; Resolute Paper Products Corp., 8 cents less 2 per cent; Walker, Goulard Plehn Company, 10.15 cents less 2 per cent; R. P. Andrews Paper Company, 8.75 cents; Enterprise Paper Company, 7.99 cents less 2 per cent; Mathers-Lamm Paper Company, 7.8 cents; and Mudge Paper Company, 8.09 cents.

TAPPI Notes

Reprints of the Index to the Technical Section of the PAPER TRADE JOURNAL for the first half of 1938 are now available to members. Copies may be obtained from TAPPI, 122 E. 42nd street, New York, (without charge to members).

For the benefit of TAPPI members enroute to the Green Bay convention, Sept. 8-10, 1938 the Palmer House Chicago, Ill. will reserve a headquarters room for those who may wish to use it.

H. M. Grasselt formerly with the Collins Manufacturing Company, N. Wilbraham, Mass. is now with the Erving Paper Mills, Erving, Mass.

William A. (Spike) Kelley, E. D. Jones & Sons, who was in an automobile accident in Arkansas now reports that he is well on the road to complete recovery and plans to attend the TAPPI convention at Green Bay in September.

Eddy Paper Corp. Reports $69,345

The Eddy Paper Corporation reports as follows for the six months to June 30: Net profit, $69,345, equal to 39 cents a share on 178,000 common shares, compared with a net profit of $533,709, or $3 a share on the stock, for the corresponding period in 1937.

Newsprint Production For July

Production of newsprint in Canada during July 1938 amounted to 202,546 tons and shipments to 205,490 tons, according to the News Print Service Bureau. Production in the United States was 63,278 tons and shipments 69,718 tons, making a total United States and Canadian news print production of 265,824 tons and shipments of 275,208 tons. During July, 20,972 tons of news print were made in Newfoundland, so that the total North American production for the month amounted to 286,796 tons. Total production in July 1937 was 424,333 tons.

The Canadian mills produced 641,537 tons less in the first seven months of 1938 than in the first seven months of 1937, which was a decrease of thirty and five tenths per cent. The output in the United States was 91,009 tons or sixteen and six tenths per cent less than in the first seven months of 1937, in Newfoundland 55,227 tons or twenty-six and five tenths per cent less, making a total decrease of 787,773 tons, or twenty-seven and five tenths per cent.

Stocks of news print paper at the end of July were reported at 179,282 tons for Canadian mills and 22,557 tons for United States mills, making a combined total of 201,839 tons compared with 211,223 tons on June 30, 1938.

Belgrade Negotiates for Pulp Mills

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., August 17, 1938—Negotiations are reported to be under way in Belgrade for the construction of 3 wood pulp mills, according to a report from the office of the American Consulate, Belgrade. The proposed investment will amount to approximately $4,660,000. The mills, if erected, will be located at Bosnia, Lika and Slovenia. The entire production of these mills will be manufactured for export. Austria has ceased to export wood pulp formerly shipped in large quantities to Italy and France, and Yugoslavia interests hope to replace Austria as the supplier of wood pulp for those markets.

Formosa To Make Pulp From Bagasse

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., August 17, 1938—The inaugural meeting of the Shin Nippon Sugar Industry Company was held recently, according to a report from the office of the American Commercial Attache, Tokyo. The new company has decided to locate its plant at Taishikyu, Tainan Province inTaiwan (Formosa). Work is now being rushed to complete the plant by November. The new company will manufacture pulp from bagasse. Initial output is placed at 30,000 metric tons per year.

Huntingdon Talc Syndicate Formed

[FROM OUR REGULAR CORRESPONDENT]

TORONTO, Ont., August 15, 1938—The Huntingdon Talc Mining Syndicate, Limited, with headquarters in Toronto, has been granted a provincial charter and an authorized capital of $35,000 to prospect, develop and maintain mines and mineral lands. It is understood that operations will be carried on in Hastings county. The coated paper trade is much interested in the development of talc mines which product is used largely in turning out coated stock of all kinds.

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COMING EVENTS IN THE PAPER INDUSTRY

TECHNICAL ASSOCIATION OF THE PULP AND PAPER INDUSTRY. Fall meeting, Northland Hotel, Green Bay, Wis., September 8-10.

NATIONAL PAPER TRADE ASSOCIATION. Fall convention, Stevens Hotel, Chicago, Ill., September 19-21.

AMEND THE WAGNER ACT

It is unfortunate for the industrial peace of the country that the Wagner Act has in its short but turbulent existence proved a lamentable failure. In common with many other acts of the New Deal the Wagner Act was, for reasons of political expediency, hastily thrown together and jammed through the legislative hopper. The result is what could be expected, an ill-conceived and badly phrased law which cannot be clearly and equitably interpreted by any one, as the efforts of the National Labor Relations Board have in its many rulings repeatedly demonstrated.

The National Labor Relations Board passed its third anniversary in June and in reviewing its record of cases won it announced it had successfully handled in three years up to June 1, 1938, 11,180 labor disputes. Nothing is said by the Board of the disputes caused by the Wagner Act and its interpretations of it, nor does the Board refer to the fact that in the period from March to September 1937, the number of strikes and persons affected thereby had increased to the highest level in twenty years.

The National Labor Relations Board has been severely criticized by employers on the ground that the Board's rulings have been one-sided and favored labor to a degree that was unjust to the employer. Accusations that the Board favored the interests of the Committee of Industrial Organization union at the expense of employers and the American Federation of Labor union have been frequently expressed. The charges that communism exists in the C.I.O. have been made and the dissension has caused a split in some trade organizations in the automobile industry affiliated with the C.I.O.

In reference to the attitude of one employer who has been successful in its refusal to sign a contract with the C.I.O., T. M. Girdler, chairman of the Republic Steel Corporation, in a statement submitted to the Senate Civil Liberties Committee and put in the record on August 11th, said in part: "In requesting an investigation of the C.I.O., let me make it clear that I do not condone nor will I attempt to justify, any reprehensible act that may be truthfully laid to any one connected with the Republic Steel Corporation. Your committee has laid great stress upon the alleged activities of our police department along the line of labor espionage. Let me state flatly and emphatically that any activities of our company guards beyond the safeguarding of our properties against vandalism and sabotage and the protection of our employees from violence were without my knowledge.

"The committee has devoted much attention to the strike of 1937. That strike was called by the C.I.O. solely because of its insistence that we sign a contract. There was no question involved of wages, hours, working conditions, or even of collective bargaining. But actual questions of civil rights were involved—the right of men to work when and for whom they chose and the right of the Republic Steel Corporation to decide for itself whether it should or should not sign a contract.

"Our refusal to sign a contract was based upon three main considerations, all of which have been amply justified by subsequent events. First, we were convinced that an overwhelming majority of our employees did not want us to sign. They made this plain to the management in no uncertain terms. Our position was justified by the fact that when the strike was called some 23,000 out of a total of 45,000 workers in the mills remained on the job, while other thousands tried to work and were prevented by pickets, most of whom were not employees. Moreover, when mass picketing and picket violence was stopped by the authorities, thousands more returned to their jobs immediately. Second, we were convinced that a contract was but the first step toward a closed shop and the check-off, the ultimate goal of the C.I.O.

"That position has been confirmed by statements of the C.I.O. officials themselves. John L. Lewis, himself, declared for the closed shop in a press interview on April 14, 1937, a copy of which I am offering for the record. We opposed the closed shop because it denies the right of a man to work where he pleases with or without membership in any labor organization. Moreover, it would create a labor union monopoly, harmful in the long run both to the workers and to the public. Third, we were convinced that the C.I.O. was not under responsible leadership, and that the communistic influences were dominating its

activities. There was no assurance that any agreements made by us would be kept by the other side. That position also has been amply justified by the overwhelming evidence of subsequent happenings. I need only to cite the many strikes in plants where C.I.O. agreements were in effect and the numerous exposures of communistic influences in the C.I.O. . . . The literature of the Communists, including nearly every issue of *The Daily Worker*, is full of boasts of the important part the party is playing in the C.I.O. I quote from the party *Organizer*, issued by the Central Committee of the Communist Party, U.S.A., of March 1938, page 1, as follows: 'It will suffice to recall to you the active participation and leading role our party played in the great mass struggles at Goodyear, Firestone, Fisher Body, Republic and Youngstown Steel, as well as the active and, in many cases, leading role of the Communists in Ohio in organizing drives of the C. I. O. in these industries and many others.' "

In recommending that the Wagner Act be amended to insure industrial peace, Mr. Girdler said in part: "No tribunal can be impartial if it acts as combined investigator, prosecutor, judge and jury. This tyrannical procedure, now standard practice for the Labor Board under the Wagner Act, has no place in a democracy. The act should be amended to provide a tribunal properly in keeping with American practices. (2) No law can be fair which grants one group a privilege which it denies to another group. The act should be amended so that the employer as well as the employee may bring complaint before the tribunal. (3) The act as presently interpreted and administered by the Labor Board restricts the right of free speech. The board deprives the employer of the right to express his opinion to his own employees. The act should be amended so that there can be no question that it conforms to our Bill of Rights of the Constitution and preserves the guarantees of free speech, which is one of our most important civil liberties. (4) The act as now written protects the employee against coercion by the employer. This does not go far enough. In the interests of civil liberties and civilization the act should be amended also to protect the workers against coercion from any source, including labor union organizers and sympathizers and the ruthless tactics indulged in by them. The act should define unfair practices on the part of labor organizations as well as employers. (5) There should be added to the act some provision which will impose upon unions responsibility for their actions. If collective bargaining is actually to be what the term implies, each side to the bargain must be a responsible party. Furthermore, this responsibility should extend to picketing, placing an obligation on unions not to conduct picketing destructive to any man's right to work. Amendment of the act along these lines, I am convinced, would usher in a period of sane labor relations and good will throughout industry in this country."

The restrictions now imposed by the Wagner Act take from the employer his time-honored rights and in the same act extends the right of employees through union membership to dictate in a manner which common sense clearly indicates is entirely outside the proper field of employee activity and usurpation of the rights of the employer. Clearly something should be done to more clearly reveal the spirit of justness in the faulty Wagner Act.

Production Ratio Report

(These statistics are based upon paper production reports to the American Paper and Pulp Association)

The following statistics show the number of mills reporting by ratio groups:

COMPARATIVE MONTHLY SUMMARIES

Months	1938(c)	1937(c)	1936	1935	1934
January	63.9%	90.3%	76.1%	65.8%	.....
February	68.7	90.1	77.9	70.0	.....
March	69.6	90.3	76.0	70.5	.....
April	68.3	92.1	82.3	70.0	.....
May	69.0	90.6	81.6	69.4	.....
June	65.8	87.3	80.7	72.3	.....
July	71.9	81.8	77.3	64.9	.....
August	...	82.9	81.5	70.9	.....
September	...	78.6	80.5	71.9	58.2%
October	...	73.5	87.6	75.6	64.7
November	...	61.9	88.0	75.3	61.7
December	...	54.5	85.9	71.2	59.6
Year Average	...	80.6	81.3	70.5	.....
First 31 weeks	68.2	88.7	78.9	69.0	.....

COMPARATIVE WEEKLY SUMMARIES

Current Weeks, 1938		Corresponding Weeks, 1937	
*July 2	68.6%	July 3	85.2%
*July 9	58.6	July 10	69.8
*July 16	75.6	July 17	87.6
*July 23	76.2	July 24	85.9
*July 30	77.4	July 31	83.9
*August 6	71.6	August 7	82.6

NUMBER OF MILLS REPORTING, CURRENT WEEKS

Ratio Limits	July 2 1938	July 9 1938	July 16 1938	July 23 1938	July 30 1938	Aug. 6 1938
0% to 50%	110	130	84	76	83	63
51% to 100%	199	176	224	228	208	147
Total Mills Reporting	309	306	308	304	291	210

* Subject to revision until all reports are received.
(c) Basic capacity data have been adjusted to correspond with ratings reported by individual companies.

Paperboard Operating Ratios

According to reports from the National Paperboard Association, per cents of operation, based on "Inch-Hours", were as follows:

Months	1938 (e)	1937 (e)	1936	1935	Months	1938 (e)	1937 (e)	1936	1935
January	55%	80%	61%	61%	July	....	67%	69%	59%
Feb.	61	86	67	67	Aug.	....	74	75	65
March	60	87	68	67	Sept.	....	70	76	69
April	57	89	70	61	Oct.	....	66	82	76
May	58	86	68	61	Nov.	....	56	79	70
June	56	75	68	65	Dec.	....	46	74	60

Week end. July 2, 1938	62%	Week end. July 23, 1938	65%
Week end. July 9, 1938	37	Week end. July 30, 1938	64
Week end. July 16, 1938	60	Week end. Aug. 6, 1938	64

(e) Basic figures revised to include new members of the National Paperboard Assn.

Japan Checks Use of Wood for Pulp

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., August 3, 1938—Current reports in paper circles indicate that the Japanese government has decided to check the establishment of new wood pulp plants and the expansion of ones already in existence for fear of a dearth of wood supplies in the near future, according to reports from the American Commercial Attache, Tokyo.

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Section of the
Technical Association of the Pulp and Paper Industry

Edited by Ronald G. Macdonald, Secretary

Review Of The Paper Industry Literature

Abstracts Compiled By the Abstracts and Bibliography Committee of the Technical Association of the Pulp and Paper Industry, A. Papineau-Couture, John F. Ohlson, C. E. Peterson and Clarence J. West, Chairman.

Copies of United States Patents can be obtained from the United States Patent Office, Washington, D. C., for 10 cents each. Send currency, not stamps.

Raw Materials

Chemical Structure of Wood. A. v. Wacek. Z. Papier, Pappe, Zellulose, Holzstoff 56, no. 3/4: 27-36 (Feb. 28, 1938); B. I. P. C. 8:315.—The author reviews the main constituents of wood, cellulose, hemicelluloses, and lignin, and current theories concerning their chemical constitutions and micellar structure. The mechanical and chemical behavior of these constituents during digesting, semi-chemical pulping, wood saccharification, etc., is discussed. The main problem is still the study of lignin with regard to constitution and economical utilization.—C.J.W.

Producing Forest Trees With Improved Number of Chromosomes and Improved Wood Yield. H. Nilsson-Ehle. Svensk Pappers-Tidn. 41, no. 2: 42-46 (Jan. 31, 1938); B. I. P. C. 8:284.—Reference is made to successful Swedish forestry experiments begun in 1937 for producing tetraploid aspen trees (chromosome number 76) by crossing the diploid Swedish aspen (*Populus tremula L.*, chromosome number 38) with the triploid giant aspen (chromosome number 57). The resulting plants are exceedingly sturdy in growth with leaves about twice the size of the diploid, and still larger than the triploid species. The latter is decidedly superior to the ordinary aspen with regard to rate of growth and wood yield, and it is reasonable to expect that the tetraploid species will signify a further improvement. This, however, can only be confirmed by further practical studies. Continued breeding and crossing experiments on a large scale are required for further evaluating these results, not only in the case of aspen but also of birch. The author places special emphasis on the necessity of large scale trials; investigations on a small scale in this case do not lead to conclusive results and are a wasteful procedure. The method is not yet applicable to conifers, such as spruce and pine.—C.J.W.

Tropical Paper Timber. Fritz Hoyer. Tropenpflanzer 40: 503-529 (1937); C. A. 32:2737.—Many tropical species of trees are suitable stock for paper and pulp production. However, the low density—averaging about 0.300, while the density of pine used in Germany is 0.450—creates a shipping disadvantage. The difficulty can be remedied by concentration of the fiber through chemical or mechanical means. The latter method, which is preferred, can achieve a three-fold concentration. In general the tropical woods are not suitable as half stuff similar to the usual mechanical wood pulp but there are important exceptions. An extensive table lists the tropical trees of Africa, South America, Asia, Australia, etc., with a description of properties and comments on utilization. 75 references.—C.J.W.

The Chemistry of Wood. René Escourrou. Bull. Inst. Pin Jan., 1938: 18-22.—A brief review of the practical application of the chemical properties of wood and cellulose, indicating the principal products which can at present be obtained from wood.—A.P.-C.

Characteristics of Sulphite and Kraft Pulps From Blue-stained Southern Pine. G. H. Chidester, M. W. Bray and C. E. Curran. Paper Trade J. 106, no. 14: 43-46 (April 7, 1938)—Blue-stained wood gives unbleached sulphite pulp that is darker in color, has a higher dirt content, and requires more bleach than pulp from unstained wood, these differences being proportional to the percentage of stained wood used. No significant differences in the yield or strength properties of the pulp results from blue stain; and there is no appreciable differences in the results of inoculated and naturally infected woods. Unbleached sulphate pulps from blue-stained wood are darker in color, contain more specks and require from 2.5 to 5% more bleach than pulp from unstained wood. As in the case of sulphite pulp, no difference in yield is attributable to blue stain, and there is no appreciable difference in the effects of staining in the field and in the laboratory.—A.P.-C.

Chemical Composition of Picea Ajanensis. I. Schimoda and S. Kamihara. J. Cellulose Inst. Tokyo 13: 384-390 (1937).—Data are given showing the variation in composition of the wood with the height above the ground and the distance from the center of the trunk. With increasing height the ash and cellulose contents decrease and the benzene-alcohol extract and pentosan content in-

crease. The cellulose content increases towards the center, and the contents of lignin and mannan vary irregularly.—A.P.-C.

Wood Chemistry. X. Chemical Composition of Akamatsu (Pinus Densiflora). Y. Uyeda and T. Ohta. J. Cellulose Inst. Tokyo 13: 38 (1937).—Analytical data are given, including: cellulose 50.27 per cent, lignin 25.59 per cent, and loss on drying 11.17 per cent.—A.P.-C.

Manchurian Woods for Manufacture of Pulp. I. Miura and S. Maeno. J. Cellulose Inst. Tokyo 13: 430-441 (1937).—Full analyses, and the results of cooking experiments under various conditions, are given for the following Manchurian woods: *Pices obovata* Ledeb., *Abies nephrolepsis Max.*, *Pinus koraiensis* S and Z., *Populus maximowitzii* A. Henry, *Populus tremula* L., *Tilia mandhurica* R. and M., and *Betura mandshurica* Nakai. *Abies nephrolepsis* has the longest fiber and *Populus tremula* the shortest. The hard woods were digested best by long cooking with a liquor of low total sulphur dioxide content, and the soft woods by a shorter cooking with a liquor of higher total sulphur dioxide content. *Pinus koraiensis* was not well cooked under any of the conditions tested.—A.P.-C.

Tropical Woods for the Manufacture of Pulp. I. Chemical Composition of Philippine Woods. I. Miura. J. Cellulose Inst. Tokyo 13: 442-446 (1937).—Full chemical analyses are given of 12 Philippine species. These differ from Japanese hardwoods in possessing a higher content of soluble matters and lignin and a lower content of cellulose and pentosan. Red lauan had the highest cellulose content (52.25%), and ipil and yacal the lowest (38.92 and 38.90%). No relation was found between botanical classification and chemical composition.—A.P.-C.

Cellulose. IV. Cooking Experiments With Cellulose Woods From Korea and South Sakhalin, Conifers From Manchukuo, and Larches From Various Sources. Y. Hukuda, S. Mititaka and M. Yamaguti. J. Cellulose Inst. Tokyo 13: 447-451 (1937).—The best results were obtained with Akaezomatsu (*Picea glehnii* Mast.) from South Sakhalin. Other woods from South Sakhalin and those from Korea gave inferior celluloses or were less easily cooked, and the most important conifers from Manchukuo were still less easily cooked. This is ascribed partly to their physical condition, as little difference in chemical composition can be found.—A.P.-C.

Density and Rate of Growth of the Wood of Spruce and Balsam in Eastern Canada. J. D. Hale and J. B. Prince. Pulp Paper Mag. Can, 39: 138-142 (Feb., 1938).—A summary of the results of the systematic tests carried out over several years by the Forest Products Laboratories of Canada, together with the indication of a method for reporting specific data for each particular stand of pulpwood which was sampled.—A.P.-C.

Output and Problems of Wood Chemistry. Roland Runkel. Wochbl. Papierfabr. 68, no. 48: 903-07 (Nov. 27, 1937).—The evolution of the wood chemistry industries, future problems, wood chemistry and its raw materials, political economics in the chemical wood working, and diagrammatic charts of the wood working industries are discussed. Considering that less than 60 per cent of the wood substance is used in the pulp industries, about 55 per cent in the carbonization of wood and that 65 to 70 per cent is used in the saccharification of wood, and the balance is either a total loss or is burned; the real problem is the utilization of this product which is lignin or its by-products.—J.F.O.

The Sufficiency of the World's Production of Wood for Continually Covering the Requirements for Ground Wood and Pulp. V. Dieterich. Papier-Fabr. 35, no. 40: 377-84 (Oct. 1, 1938).—The author discusses the area, the annual growth, the percentage of the various kinds of wood, the amount of wood annually consumed; for Soviet Union and all the principal pulp producing countries of the world. In conclusion the statement is made that the present growth of wood is sufficient to meet the present demands, and as the demand increases there will be increased efficiency in manufacture and utilization of new kinds of wood.—J.F.O.

The Resin of the Indigenous Conifers, Its Constitution and Its Changes During the Decomposition of Wood. H. Wienhaus. Papier-Fabr. 35, no. 41: 385-92 (Oct. 8, 1937).—Anatomical studies are first made on pine wood which have been cut across, radially and tangential. Then analysis have been made on the resins obtained and structural formulas given. After decomposition of the wood, analysis were again made on the products of decomposition.—J.F.O.

The Importance of Wood Protection for the Manufacture of Paper. Edgar Morath. Wochbl. Papierfabr. 68, no. 48:925-28 (Nov. 27, 1937).—The many different types of fungus, insects, etc. that destroy wood are described, and several methods for protecting the wood against this destruction are given. Wood used in paper mill buildings where it must withstand certain injurious conditions is discussed with methods for preservation. —J.F.O.

A New Method for the Conservation of Wood. Wochbl. Papierfabr. 68, no. 42: 794 (Oct. 16, 1937). —Wood immersed under pressure in a two per cent solution of a mixture of arsenic pentoxide and alkali bichromate in the ratio of 1 : 1.25 to 1 : 1.75 is effective against fungus growth and wood destroying insects. This preservative for wood cannot be removed by water, and is not corrosive to iron and furthermore has some fire protection. —J.F.O.

Pulp From the Stalks of Sorghum. Zellstoff u. Papier 17, no. 11: 473-74 (November, 1937).—Experiments conducted in an Italian research bureau for paper and textiles; have demonstrated that a pulp of 40 to 50 per cent yield can be obtained from sorghum. The fibers are similar to esparto and straw, and consists of fine and uniform bast fibers of good length.—J.F.O.

Process for the Decomposition of Willow Bark. A. Hammer, Berlin. Ger. pat. 646,557 (Feb. 22, 1934).—After extraction of the tannic acid by leaching with water; the bark is cooked with caustic soda or sodium sulphite for several hours at a pressure of one to three hours, then treated with a mixture of one part sulphurous acid and three parts hydrochloric acid in ten parts water. —J.F.O.

Can Valuable Pulp Be Made From Bagasse? O. Kuhne. Zellstoff u. Papier 17, no. 12: 526-31 (Dec., 1937).—One of the many investigators of bagasse for pulp manufacture, E. A. Ritter has discovered a method for preventing the decay of bagasse which takes place in less than two weeks due to the high moisture content and the amount of fermentable material. Two different series of cooks were instigated, the cooking conditions, the bleaching, making the paper and the tests of the finished paper. From an evaluation of the process and results, the author believes that bagasse will be an important raw material for the production of paper in Germany.—J.F.O.

Paper and Pulp From Straw. van der Werth. Zellstoff u. Papier 17, no. 10: 438-39; no. 11: 469-72; no. 12: 531-33 (Dec.-Oct., 1937).—Because of the shortage of raw materials in Germany; the author a patent atorney, has compiled the important patents on the subject. The material is classified as follows, pre-treatment, decomposition by cooking with water or steam, decomposition with lime, decomposition with sodium hydroxide, with soda, with sulphides, with sulphites, with nitric acid, with chlorine, and with combined processes. And in conclusion, patents on apparatus used are cited and briefly described.—J.F.O.

Cellulose and Lignin

Properties and Characteristics of Cellulose Materials. D. Kruger. Zellstoff u. Papier 17, no. 10: 433-35 (October, 1937).—Roentgenographic investigations have shown that the crystalline constitutents of cotton cellulose and wood cellulose are chemically alike. Discussion concerning certain points on alpha cellulose and pentosane content, on copper number, rosin content, ash content and its composition, viscosity and the swelling properties. The turbidity of solutions of cellulose esters is commented on and many other recent discoveries concerning cellulose materials. —J.F.O.

The Hemicelluloses. III. Extraction and Preparation. Arthur G. Norman. Biochem. J. 31: 1579-1585 (1937).—When alcoholic soda is used as a pretreatment before hemicellulose extraction, it should be established by analysis of the residue that the furfuraldehyde-yielding constituents have not been attacked. Extensive removal of hemicelluloses may be effected by extraction with cold 4 per cent sodium hydroxide alternated with brief chlorinations. Such extracts contain a large proportion of cellulose-derived polysaccharides, while extracts with hot more dilute alkali consist largely of polyuronide hemicelluloses. The lignin content of hemicellulose preparations should always be determined. It may be reduced by brief treatment with chlorine and thorough washing with alcohol of moderate concentration.—A.P.-C.

Studies on Flax Cellulose. J. Dabrowski and L. Marchlewski. Bull. Intern. Acad. Polon. Sci., Classe. Sci. Math. Nat. 1937A: 201-216.—Flax cellulose shows similar chemical properties to cotton cellulose. Hydrolysis to glucose and acetylation to the triacetyl derivatives proceeds alike for both flax and cotton celluloses. The copper number of the acetylcelluloses varies with the mode of formation and is inversely proportional to the viscosity. The absorption of ultraviolet light is continuous and the transparency is not a function of viscosity. Under the action of concentrated acids flax cellulose is converted into a hydrocellulose similar to that obtained from cotton cellulose. Freshly prepared solutions in sodium hydroxide of these products do not show selective absorption of short light waves but prolonged action of sodium hydroxide causes the formation of decomposition products which do absorb the light selectively. —A.P.-C.

The Absorption of Water By Cellulose and Cellulose Compounds. J. Tankard. J. Textile Inst. 28: T263-292 (1937).—The work of different investigators to obtain precise information on the absorption of water by cellulose and cellulose compounds and the various theories advanced to explain the associated phenomena are reviewed. The method of Champetier for the determination of water of hydration, viz., the study of the ternary system cellulose-water-sodium thiosulphate (or pyridine), is discussed in detail. This method was used in the present study. The results do not indicate that cellulose and its compounds form a limited number of definite hydrates, but that there is, for each of the substance examined, a maximum amount of water that can be regarded as entering into chemical combination. This maximum value corresponds to 0.5 molecules of water per $C_6H_{10}O_5$ unit for bleached cotton and linen cellulose; 0.75 for mercerized cotton cellulose that was dried subsequent to mercerization; 1.0 for mercerized cotton cellulose that was not dried after mercerization, for mercerized linen cellulose whether or not dried after mercerization, and for regenerated (viscose) cellulose; and 3.0 for cellulose triacetate and for cellulose monomethylene ether.—A.P.-C.

Refractive Indices of Cellulose. II. Cellulose Hydrate. K. Atsuki and S. Okajima. J. Soc. Chem. Ind. Japan 40: 362-365B (1937).—Measurements were made with ramie mercerised under tension and with isotropic cellulose hydrate prepared by spinning without tension. The latter gave 1.5356, and the refractive index values of the micelle of cellulose hydrate were calculated to be 1.577 and 1.515.—A.P.-C.

Photochemical Reaction of Cellulose. IX. Influence of the Gaseous Medium. S. Oguri and T. Yamaguchi. J. Soc. Chem. Ind. Japan 40: 356B (1937).—Exposure of filter paper to ultraviolet light in media of air, nitrogen, hydrogen, carbon dioxide and coal gas, containing 21, 1.6, 0.8, 2.7 and 6.7 per cent of oxygen, resulted in increases of copper number of 0.364, 0.243, 0.466, 0.409 and 0.290. It is concluded that the formation of aldehydic substances is not dependent on the presence of oxygen.—A.P.-C.

Lignin and Related Compounds. XXIX. The Acidic Hydroxyl Groups in Spruce Lignin. R. G. D. Moore, George F. Wright and Harold Hibbert. Can. J. Research 15B: 532-535 (1937).—A demethylated spruce lignin suitable for further study has been obtained by treating methylated methanol lignin with hydriodic acid. This treatment removes the aliphalic hydroxyl, and leaves 6.9 aromatic and 0.6 carboxylic hydroxyl groups per kilo. On the basis of the phenolic content it is estimated that the maximum aromatic content of spruce lignin is about 40 to 45 per cent.—A.P.-C.

Operations—Cost—Sales*

By John P. Hagenauer[1]

The study of economics proves that the success and prosperity of any group depend on the harmonious cooperation of the individuals. The members of any such group can be classified under three distinct headings—producer, middle-man and consumer. This trilogy can be traced not only in nations, states, cities, etc., but also in industry down to the individual plant.

In the mills of our industry such a trilogy is represented by operation-cost-sales; sales representing the consumer, operation the producer and cost the middle-man reconciling the first two. Their harmonious cooperation will produce the profit,—the ultimate object of manufacturing.

All three are conscious of this truth, but in many cases their relation to each other are far from perfect and anything but harmonious. The sales department feels that there is no relation between price and cost and claims that the cost department is wrong. It in turn thinks all fault lies with the sales department. Together they blame the operator and he in turn feels that the first two do not know what they are talking about.

The purpose of this presentation is to show how through simple application of cost engineering to the data available closer understanding and cooperation can be promoted. All figures presented here are based on actual machine performance observed during three years of study.

Whenever any mill has an opportunity to obtain an order for a given grade of paper, the question "can this paper be produced at a profit for the price which must be quoted?" is raised immediately. To simplify the problem for this discussion, the paper machine conversion cost only will be considered.

From the quoted price f.o.b. mill there must be deducted the expected profit, the raw material cost and every other expenditure not covered by the paper machine conversion cost. The residual is the amount of money for which the paper must be produced per ton on the paper machine.

The paper machine conversion cost per ton equals the hourly conversion cost divided by the production per hour in tons. The paper machine production per ton equals the production in pounds per hour and this latter assuming a basic ream of 500 sheets and a base size of 24 x 36 inches equals the trim times the speed times the basis weight times the per cent of operation divided by 1,200,000. By substituting the last expression for production per hour in tons into the formula for conversion cost per ton it is found that this cost can be expressed as 1,200,000 times the cost per hour divided by the product of trim, speed, basis weight and per cent of operation.

This expression can be solved for either of the variables to see which limits will satisfy the conversion cost per ton fixed by the price. Some of these limits should be known to the sales department before taking any order and other to the operators before starting production.

To illustrate the application let us use a paper machine under the following conditions:

1. Amount of money available for paper machine conversion cost per ton = $20.00.

2. Maximum trim of machine 145 inches minimum speed 330 feet per minute and maximum 600 feet per minute.

Minimum basis weight 40 pounds and maximum 50 pounds.

Maximum per cent of machine operation of 95.75 per cent based on minimum down time of 4.25 per cent for wash-ups and order changes.

3. Hourly paper machine conversion cost of $45.00.

* Presented at the Annual Meeting of the Technical Association of the Pulp and Paper Industry, Waldorf-Astoria Hotel, New York, N. Y., Feb. 21-24, 1938.

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TABLE B—

Speed Trim	382.00	386.03	389.98	394.00	398.10	402.29	406.57	410.95	415.41	419.98	424.64	429.41	434.29	439.29	444.39	449.62	454.97	460.46	466.01
					Per Cent of Operation														
145.00	95.75	94.79	93.83	92.88	91.92	90.96	90.91	89.05	88.09	87.13	86.18	85.22	84.26	83.30	82.35	81.39	80.43	79.47	78.53
143.55	....	95.75	94.78	93.82	92.85	91.88	90.91	89.95	88.98	88.01	87.05	86.08	85.11	84.14	83.18	82.21	81.24	80.27	79.32
142.10	....	....	95.75	94.77	93.80	92.82	91.84	90.86	89.89	88.91	87.93	86.96	85.98	85.00	84.03	83.05	82.07	81.09	80.13
140.65	....	....	....	95.75	94.75	93.76	92.78	91.79	90.80	89.81	88.83	87.84	86.85	85.87	84.88	83.89	82.91	81.92	80.94
139.20	....	....	....	....	95.75	94.75	93.76	92.76	91.76	90.76	89.77	88.77	87.77	86.77	85.78	84.78	83.78	82.78	81.79
137.75	....	....	....	....	....	95.75	94.74	93.73	92.72	91.71	90.71	89.70	88.69	87.69	86.68	85.67	84.66	83.65	82.66
136.30	....	....	....	....	....	....	95.75	94.73	93.71	92.69	91.68	90.66	89.64	88.62	87.60	86.58	85.56	84.54	83.54
134.85	....	....	....	....	....	....	....	95.75	94.72	93.69	92.66	91.63	90.60	89.57	88.54	87.51	86.48	85.45	84.43
133.40	....	....	....	....	....	....	....	....	95.75	94.70	93.67	92.63	91.59	90.55	89.50	88.46	87.43	86.38	85.35
131.95	....	....	....	....	....	....	....	....	....	95.75	94.69	93.65	92.59	91.54	90.49	89.44	88.39	87.33	86.29
130.50	....	....	....	....	....	....	....	....	....	....	95.75	94.69	93.62	92.56	91.49	90.43	89.37	88.30	87.25
129.05	....	....	....	....	....	....	....	....	....	....	....	95.75	94.67	93.60	92.53	91.45	90.37	89.29	88.23
127.60	....	....	....	....	....	....	....	....	....	....	....	....	95.75	94.66	93.57	92.49	91.40	90.31	89.23
126.15	....	....	....	....	....	....	....	....	....	....	....	....	....	95.75	94.65	93.55	92.45	91.35	90.26
124.70	....	....	....	....	....	....	....	....	....	....	....	....	....	....	95.75	94.64	93.52	92.41	91.31
123.25	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	95.75	94.63	93.50	92.38
121.80	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	95.75	94.61	93.48
120.35	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	95.75	94.61
118.90	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	95.75
117.45	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
116.00	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
114.55	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
113.10	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
111.65	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
110.20	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
108.75	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
107.30	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
105.85	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
104.40	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
102.95	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
101.50	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
100.05	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
98.60	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
97.15	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
95.70	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
94.25	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
92.80	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
93.00	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....

TABLE A—40 LB. BASIS WEIGHT

Speed / Trim	477.72	482.55	487.47	492.49	497.62	502.87	508.22	513.68	519.27	524.97	530.80	536.76	542.87	549.11	555.49	562.03	568.72	575.57	582.59	589.78	597.15	600.00
					Per Cent Operation																	
145.00	95.75	94.79	93.83	92.88	91.92	90.96	90.00	89.05	88.09	87.13	86.18	85.22	84.26	83.30	82.35	81.39	80.43	79.47	78.52	77.56	76.60	76.24
143.55	....	95.75	94.78	93.82	92.85	91.88	90.91	89.95	88.98	88.01	87.05	86.08	85.11	84.14	83.18	82.21	81.25	80.27	79.31	78.34	77.38	77.01
142.10	....	....	95.75	94.77	93.80	92.82	91.84	90.86	89.89	88.91	87.93	86.96	85.98	85.00	84.03	83.05	82.07	81.09	80.12	79.14	78.16	77.79
140.65	....	....	....	95.75	94.76	93.77	92.79	91.80	90.81	89.83	88.84	87.86	86.86	85.88	84.89	83.91	82.92	81.93	80.94	79.96	78.97	78.59
139.20	....	....	....	....	95.75	94.75	93.76	92.76	91.76	90.76	89.77	88.77	87.77	86.77	85.78	84.78	83.78	82.78	81.78	80.79	79.79	79.41
137.75	....	....	....	....	....	95.75	94.74	93.74	92.73	91.72	90.71	89.71	88.69	87.69	86.68	85.67	94.66	83.65	82.65	81.64	80.63	80.25
136.30	....	....	....	....	....	....	95.75	94.73	93.71	92.69	91.68	90.66	89.64	88.62	87.60	86.58	85.56	84.54	83.53	82.51	81.49	81.11
134.85	....	....	....	....	....	....	....	95.75	94.72	93.69	92.66	91.63	90.60	89.57	88.54	87.51	86.48	85.45	84.43	83.39	82.37	81.97
133.40	....	....	....	....	....	....	....	....	95.75	94.71	93.67	92.63	91.59	90.55	89.51	88.46	87.42	86.39	85.34	84.30	83.26	82.87
131.95	....	....	....	....	....	....	....	....	....	95.75	94.70	93.65	92.59	91.54	90.49	89.44	88.38	87.33	86.38	85.23	84.18	83.78
130.50	....	....	....	....	....	....	....	....	....	....	95.75	94.68	93.62	92.56	91.49	90.43	89.37	88.30	87.24	86.28	85.11	84.71
129.05	....	....	....	....	....	....	....	....	....	....	....	95.75	94.67	93.59	92.52	91.45	90.38	89.30	88.22	87.14	86.07	85.66
127.60	....	....	....	....	....	....	....	....	....	....	....	....	95.75	94.66	93.57	92.49	91.40	90.31	89.22	88.13	87.05	86.63
126.15	....	....	....	....	....	....	....	....	....	....	....	....	....	95.75	94.65	93.55	92.45	91.35	90.25	89.15	88.05	87.63
124.70	....	....	....	....	....	....	....	....	....	....	....	....	....	....	95.75	94.64	93.52	92.41	91.30	90.19	89.07	88.65
123.25	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	95.75	94.63	93.50	92.38	91.24	90.12	89.69
121.80	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	95.75	94.63	93.47	92.34	91.19	90.76
120.35	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	95.75	94.62	93.44	92.29	91.85
118.90	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	95.75	94.60	93.42	92.97
117.45	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	95.75	94.57	94.12
116.00	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	95.75	95.30
115.55	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	95.75

Per Cent of Operation

Solving the formula for the conversion cost per ton for the per cent of operation necessary to satisfy the predetermined value available for conversion there are found four limiting values.

Trim	Speed	Basis Weight	Required Per Cent Operation
145	330	40	138.61
145	330	50	110.89
145	600	40	76.24
145	600	50	60.99

The maximum per cent of operation having been fixed at 95.75 per cent neither the 40 nor 50 pound basis weight paper can be produced profitably at the minimum speed.

Speed in Feet per Minute

The same formula as used above can similarly be solved to determine the speed limitations. The minimum speed under which both the 40 and 50 pound paper can be found only for the combination of maximum trim and maximum per cent operation. Under these conditions we find:

Trim	Per Cent Operation	Basis Weight	Minimum Speed
145	95.75	40	477.72
145	95.75	50	382.18

To meet the predetermined conversion cost per ton the paper must be of a quality and formation which will permit its production at a minimum speed of about 478 feet for 40-pound and at 382 feet for 50-pound papers.

Up to this point the following operation limits have been established:

Trim	Basis Weight	Speed	Per Cent Operation	Permissible Down Time
145	40	472.72	95.75	4.25
145	40	600.00	76.24	23.76
145	50	382.18	95.75	4.25
145	50	600.00	60.99	39.01

In case of the minimum speeds for both 40- and 50-pound papers one hundred per cent of good usable paper must be produced per hour, as the minimum permissible down time does not include time lost through the production of paper not up to standard, i.e., broke.

Permissible Variation from Maximum Trim

The effect of the variation of the trim below the maximum trim of the machine frequently is underestimated and disregarded when accepting orders. The minimum permissible trim for which the predetermined conversion cost per ton can be realized can be used only in connection with maximum speed and maximum per cent of operation. Substituting the respective maxima into the cost per ton formula the following minimum trims are found:

50 LB. BASIS WEIGHT

471.83	477.73	483.77	489.97	496.33	502.87	509.57	516.46	523.53	530.80	538.28	545.97	553.88	562.02	570.41	579.06	587.97	597.15	600.00
77.56	76.60	75.64	74.69	73.72	72.77	71.81	70.85	69.90	68.95	67.98	67.02	66.07	65.11	64.15	63.19	62.24	61.28	60.99
78.34	77.37	76.41	75.44	74.47	73.50	72.54	71.57	70.60	69.64	68.67	67.70	66.74	65.77	64.80	63.83	62.87	61.90	61.60
79.14	78.16	77.19	76.21	75.23	74.25	73.28	72.30	71.32	70.35	69.37	68.39	67.42	66.44	65.46	64.48	63.51	62.53	62.23
79.94	78.96	77.97	76.98	75.99	75.01	74.02	73.04	72.05	71.06	70.07	69.09	68.10	67.11	66.13	65.14	64.15	63.17	62.87
80.79	79.79	78.79	77.80	76.80	75.80	74.80	73.80	72.81	71.81	70.81	69.82	68.82	67.82	66.83	65.83	64.83	63.83	63.82
81.64	80.63	79.62	78.62	77.60	76.60	75.59	74.58	73.58	72.57	71.56	70.55	69.55	68.54	67.53	66.52	65.52	64.51	64.20
82.51	81.49	80.47	79.45	78.43	77.41	76.40	75.38	74.36	73.34	72.32	71.30	70.28	69.27	68.25	67.23	66.21	65.19	64.88
83.39	82.36	81.34	80.31	79.27	78.25	77.22	76.19	75.16	74.13	73.10	72.07	71.04	70.01	68.98	67.95	66.92	65.89	65.58
84.30	83.26	82.22	81.18	80.13	79.10	78.06	77.02	75.98	74.93	73.89	72.85	71.81	70.77	69.73	68.69	67.65	66.61	66.29
85.23	84.17	83.12	82.07	81.01	79.97	78.91	77.86	76.81	75.76	74.70	73.65	72.60	71.55	70.50	69.45	68.39	67.34	67.02
86.17	85.11	84.05	82.98	81.91	80.85	79.79	78.73	77.67	76.61	75.54	74.47	73.41	72.35	71.28	70.22	69.15	68.09	67.77
87.14	86.07	84.99	83.92	82.83	81.76	80.69	79.61	78.53	77.39	76.38	75.31	74.23	73.16	72.08	71.01	69.93	68.85	68.53
88.13	87.04	85.96	84.87	83.77	82.69	81.60	80.51	79.43	78.34	77.25	76.17	75.08	73.99	72.90	71.81	70.73	69.64	69.31
89.15	88.05	86.95	85.85	84.74	83.64	82.54	81.44	80.34	79.24	78.14	77.04	75.94	74.84	73.74	72.64	71.54	70.44	70.10
90.18	89.07	87.95	86.84	85.72	84.62	83.50	82.39	81.27	80.16	79.05	77.94	76.82	75.71	74.60	73.48	72.38	71.26	70.92
91.24	90.12	88.99	87.87	86.73	84.93	84.49	83.36	82.23	81.10	79.98	78.85	77.73	76.60	75.47	74.35	73.22	72.14	71.75
92.33	91.19	90.05	88.91	87.62	86.63	85.49	84.35	83.23	82.07	80.93	79.79	78.65	77.51	76.37	75.23	74.09	72.95	72.61
93.44	92.29	91.14	89.98	88.82	87.67	86.52	85.38	84.21	83.06	81.91	80.75	79.60	78.45	77.29	76.14	74.98	73.83	73.48
94.58	93.41	92.25	91.08	89.90	88.74	87.58	86.41	85.24	84.07	82.90	81.74	80.57	79.40	78.24	77.07	75.90	74.73	74.38
95.75	94.57	93.39	92.20	91.01	89.84	88.66	87.47	86.29	85.11	83.93	82.75	81.57	80.38	79.20	78.02	76.84	75.66	75.29
....	95.75	94.55	93.36	92.15	90.96	89.77	88.57	87.37	86.18	84.98	83.78	82.58	81.39	80.19	78.99	77.79	76.60	76.24
....	....	95.75	94.54	93.32	92.11	90.90	89.69	88.48	87.27	86.06	84.84	83.63	82.42	81.21	79.99	78.78	77.57	77.20
....	....	....	95.75	94.51	93.29	92.07	90.84	89.61	88.39	87.16	85.93	84.70	83.48	82.25	81.02	79.79	78.57	78.19
....	....	....	....	95.75	94.51	93.26	92.02	90.78	89.53	88.29	87.04	85.80	84.56	83.32	82.07	80.83	79.58	79.21
....	....	....	....	....	95.75	94.49	93.23	91.97	90.71	89.45	88.19	86.93	85.67	84.41	83.15	81.89	80.63	80.25
....	....	....	....	....	....	95.75	94.47	93.20	91.92	90.65	89.37	88.09	86.81	85.54	84.26	82.98	81.71	81.32
....	....	....	....	....	....	....	95.75	94.46	93.17	91.87	90.58	89.28	87.99	86.69	85.40	84.10	82.81	82.42
....	....	....	....	....	....	....	....	95.75	94.44	93.13	91.81	90.50	89.19	87.88	86.57	85.26	83.95	83.55
....	....	....	....	....	....	....	....	....	95.75	94.42	93.09	91.76	90.43	89.10	87.77	86.44	85.11	84.71
....	....	....	....	....	....	....	....	....	....	95.75	94.40	93.05	91.71	90.36	89.01	87.65	86.31	85.90
....	....	....	....	....	....	....	....	....	....	....	95.75	94.40	93.02	91.65	90.28	88.91	87.54	87.13
....	....	....	....	....	....	....	....	....	....	....	....	95.75	94.36	92.98	91.60	90.20	88.81	88.39
....	....	....	....	....	....	....	....	....	....	....	....	....	95.75	94.34	92.93	91.53	90.12	89.69
....	....	....	....	....	....	....	....	....	....	....	....	....	....	95.75	94.32	92.89	91.46	91.02
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	95.75	94.30	92.85	92.41
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	95.75	94.28	93.83
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	95.75	95.30
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	95.75

Basis Weight	Maximum Speed	Maximum Per Cent Operation	Minimum Permissible Trim
40	600	95.75	116.25
50	600	95.75	93.00

To operate with these minimum trims the quality and formation of the paper must permit production at 600 feet speed and no broke must be made.

Tables A and B show the per cent of operation for various trims and corresponding speed. The trim is arranged in such a way that each trim is one per cent less than the preceding trim. The speeds shown have been determined from the formula and correspond to one per cent drop in trim. Table A shows the per cent of operation for 40-pound basis weight and Table B those for 50-pound basis weight. The figures given in Tables A and B are shown graphically in Fig. 1. An ordinate drawn at any given trim will permit quick determination of the permissible limits of speeds and per cent of operation for the maximum and minimum basis weight produced on the given machine, intermediate basis weight lines can be quickly determined and entered into the chart.

From the records compiled by the men in the cost department, we have determined the following facts:

a. For the salesman
   1. That the specifications for a given grade of paper must be such that it can be run within a given speed range, and
   2. That the trim of the paper must be as close to maximum as possible and must not fall below a given minimum, if the price he accepts is to yield a decent profit to the mill.

b. For the operating man
   1. That the paper ordered must be run within definite speed limits,
   2. That the per cent down time must be as low as possible and must not exceed a given maximum,
   3. That the amount of broke must be kept to the minimum,

if the price being received for the paper is to yield the predetermined profit to the company.

c. That all of these facts are hidden in the figures compiled by the cost department regularly and are ready to be used in the files of the mills.

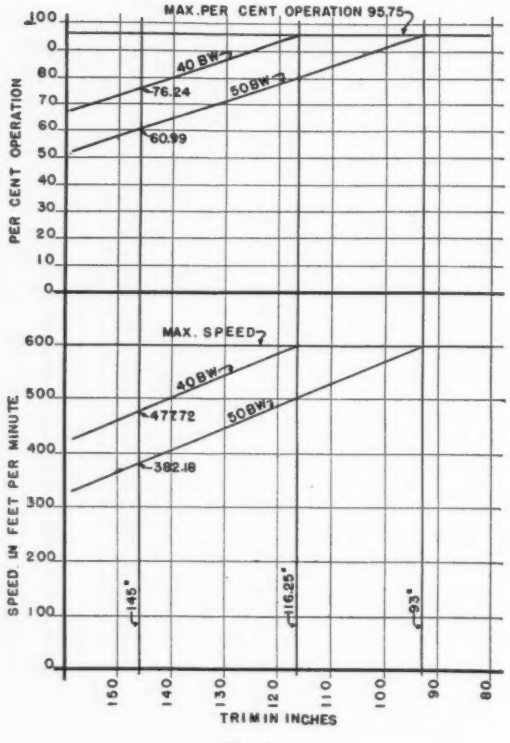

FIG. 1
Relation of Trim, Speed, Per Cent Machine Operation, and Basis Weight.

Monel Covered Rolls*

BY C. G. WATSON[1]

In an effort to supply the demand for a roll surface which would be non-corrosive, have good wearing and finishing qualities and at the same time be reasonable in cost The Youngstown Welding and Engineering Company have developed a patented protected method of applying a sheet of rolled metal to the surface of a roll.

The method is simple, although it requires skill and experience. The rolls to be covered are first prepared by accurately machining the surface to be covered. The cover is then carefully formed and fitted to the roll. Both roll and cover are then placed in a press and the cover is welded. The roll is then machined and polished.

Roll covers are made from rolled sheets of metal and are not to be compared with electroplated or sprayed metal covers. The cover is a sheet of metal. It will withstand the same wear and can be finished to the same point as the metal itself. Blistering, scaling, porosity, etc. are eliminated. Accidental injury to the surface can be repaired without the loss of the entire surface. Doctor blades are successfully used and the covers will withstand reasonable pressure.

The purpose for which the roll is intended to be used is usually the determining factor of thickness of cover and the metal to be used. The corrosive element in contact with the surface or the quality of finish desired determine the metal or alloy. Nickel and nickel alloys are very satisfactory coverings when the corrosive element is favorable to them. The coefficient of expansion of nickel and nickel alloys is very close to steel and make it a very desirable cover where heat exchange is concerned. Chrome nickel alloy covers are so very successful and have their corresponding advantages. Copper, brass and aluminum may be used but are not common.

The most outstanding thing about the development is its success. Rolls covered by this method have been out for a comparatively short time. Without being advertised and with very little promotion they have spread through the various industries. The paper, glass, textile, rubber, fiber, steel and chemical industries have found a use for them and are pleased with the service.

Rolls covered with a sheet of metal are not new. However, our method, which insures a satisfactory, serviceable and tight cover is new. We cannot hope to cure all troubles but we have solved difficult problems for others. Our method not only applies to rolls but also to the covering of shafts, pipes, tubes, agitators, driers, etc.

* Presented at the Annual Meeting of the Technical Association of the Pulp and Paper Industry, Waldorf-Astoria Hotel, New York, N. Y., Feb. 21-24, 1938.

[1] The Youngstown Welding and Engineering Co., Youngstown, Ohio.

Sulphate Recovery Thermal Code*

This code has been prepared to enable users to better evaluate the thermal factors involved in sulphate recovery, to detect undue losses from radiation and like causes, and more particularly to determine the thermal efficiency of the recovery unit. It is recognized that operating conditions vary considerably from mill to mill, depending upon the type of wood used and the type of cooking conditions maintained. Consequently, it is often difficult for a mill to judge its sulphate recovery operations on the basis of those of other mills, and this code is designed as a procedure for estimating individual operations. It is applicable to both spray-type and rotary-type recovery units.

Any thermal study involving a balance of heat input and output must have a common basis of estimation or calculation. The datum line which has been selected for this study is 70 deg. F., though any other temperature in this general range would have been satisfactory. This particular temperature is convenient because it approximates air temperature, simplifying estimations of the heat content of air and of liquids entering the recovery system. Since the spent liquors enter the recovery system at about 200 deg. F., they contain considerable sensible heat over and above the base temperature of 70 deg. F. This constitutes one factor of heat input, the other factor being the calorific value of total solids in the concentrated spent cooking liquors.

The distribution of the determinable heat output of the system is divided roughly into 3 parts: (1) that in the gases and vapors of the exit flue gas, (2) that recovered in the form of by-product steam, and (3) that leaving the furnace in the form of molten smelt. Heat in the flue gases is divided in this thermal study into that from 2 sources: (1) heat in the dry gas, and (2) heat in the water vapor associated with the dry gas. This water vapor comes from 3 sources: (1) that present in the intake air, (2) that produced by combustion of hydrogen in the fuel, and (3) that arising from evaporation of residual water in the feed liquor. Two essential factors in the heat distribution which are peculiar to sulphate recovery are the heat of reduction of salt cake and the sensible heat of the molten smelt leaving the furnace. Heat recovered as by-product steam, heat lost because of the incomplete combustion of carbon, and heat lost by radiation, are standard factors in combustion analysis.

The only factor in this study which represents production of readily available heat is that of by-product steam generated. Since, however, this is a chemical recovery as well as a heat-generating process, the heat which goes into the evaporation of a residual water in the feed liquor, into the reduction of salt cake, and into the fusing of the inorganic chemicals constitutes a thermal requirement essential to sulphate recovery and may be regarded as heat usefully expended. Consequently, estimation of operating efficiency is based on these four items.

This code is based as nearly as possible on standard combustion engineering practice. Prerequisites for its application are: analysis of feed liquor, complete operating data, and some handbook data. The calculations involved are for the most part conventional. The weight of the dry flue gas is determined by a commonly used formula which is based on simple molecular ratios involved. If desired, this may be checked by determining the volume of the gas from Pitot tube measurements, and its average molecular weight from gas analysis.

One of the most important factors in thermal efficiency in the recovery unit is the temperature of the exit flue gas. In the typical example cited below, it will be noted that the temperature of exit gas is 500 deg. F. and that 26.5 per cent of the heat input passes out in this flue gas. It is recognized that in most recovery installations gas-scrubbing devices utilizing water or feed liquor reduce the final temperature of the stack gases to 210-220 deg. F. and extract from the stack gas useful heat equivalent to about 5 per cent of the total input. Inasmuch as considerable variation exists in the design and operation of these flue-gas scrubbing mediums, no attempt has been made to incorporate in this code a standard formula for them.

The code provides space under the heading "Mill Results" for the operating data of the user. Merely by way of illustration there are set forth typical examples of the data required, gathered from reliable sources. All values are given on the basis of one ton of air-dry pulp.

* TAPPI Tenative Standard O 404 p-38, July, 1938. Send criticisms and suggestions to R. G. Macdonald, TAPPI, 122 East 42nd St., New York, N. Y.

Company ..... Mill .....
Unit No. ..... Type ..... Maker .....
Date .....

Feed Liquor Data

Item	*Mill Results*	*Typical Example*
1. Total Liquor to System, pounds Gallons (from weir readings) × density		4230
2. Water Content of Liquor, per cent From proximate analysis		35.0
3. Total Solids Content of Liquor, per cent From proximate analysis, or 100 — (item 2)		65.0
4. Organic Content of Total Solids, per cent From proximate analysis		63.9
5. Inorganic Content of Total Solids, per cent From proximate analysis, or 100 — (item 4)		36.1
6. Water in Liquor, pounds (item 1) × (item 2) ÷ 100		1480

7. Total Solids in Liquor, pounds (item 1) × (item 3) ÷ 100	2750
8. Heat Value of Total Solids, B.t.u./pound From calorific analysis	6560
9. Inlet Temperature of Liquor, deg. F. Thermometer readings	212
10. Make-up Salt Cake Added, pounds From inventory records, etc.	300

Gross Heat Input to Recovery System

11. Specific Heat of Liquor, B.t.u./pound/deg. F. By determination or calculation	0.75
12. Sensible Heat Content of Liquor, B.t.u. (item 1) × (item 11) × (item 9 — 70)	450,495
13. Calorific Value of Solids in Liquor, B.t.u. (item 7) × (item 8)	18,040,000
14. Gross Heat Input to System, B.t.u. (item 12) + (item 13)	18,490,495

Distribution of Heat Output of Recovery System

(A) Sensible Heat in Flue Gas, Dry

15. Volumetric Analysis of Flue Gas: CO_2 per cent	13.1
CO, per cent	0.2
O_2, per cent	7.7
N_2, per cent From flue gas analysis	79.0
16. Dry Flue Gas Per Pound of Carbon, pounds $\frac{(\%CO_2 \times 44) + (\%O_2 \times 32) + [(\%CO + \%N_2) \times 28]}{(\%CO_2 + \%CO) \times 12}$	19.05
17. Carbon Content of Solids, per cent From ultimate analysis of liquor	38.0
18. Carbon Content of Solids, pounds (item 7) × (item 17 ÷ 100)	1045
19. Dry Flue Gas, pounds (item 16) × (item 18)	19,907
20. Flue Gas Exit Temperature, deg. F. Thermometer readings	500
21. Specific Heat of Flue Gas, B.t.u./pound/deg. F. From handbooks	0.25
22. Sensible Heat in Dry Flue Gas, B.t.u. (item 19) × (item 21) × (item 20 — 70)	2,140,110

(B) Hydrogen Combustion Loss

23. Hydrogen Content of Solids, per cent From ultimate analysis	3.0
24. Hydrogen Content of Solids, pounds (item 7) × (item 23) ÷ 100	82.5
25. Water from Combustion of Hydrogen, pounds (item 24) × 9	742.5
26. Heat Content of Vaporized Water, B.t.u./pound From handbook, corrected to 70 deg. F.	1113
27. Specific Heat of Water Vapor, B.t.u./pound/deg. F. From Handbook	0.42
28. Hydrogen Combustion Loss, B.t.u. (item 25) × [(item 26) + (item 27) × (item 20 — 212)]	916,245

(C) Sensible Heat in Moisture in Intake Air

	Mill Results	*Typical Example*
29. Oxygen Evolved in Reduction of Salt Cake, pounds (item 10) × 64 ÷ 142; or, (item 10) × 0.4507		135
30. Weight of Dry Intake Air, pounds (item 19) — (item 29) — [(item 7) × (item 4) ÷ 100]		18,015
31. Water Vapor per Pound of Intake Air, pounds From wet and dry bulb readings; or by approximation		0.08
32. Water Vapor in Intake Air, pounds (item 30) × (item 31)		144
33. Sensible Heat Loss, Moisture in Intake Air, B.t.u. (item 32) × [(item 27) × (item 20 — 70)]		26,000

(D) Vaporization of Water in Liquor

34. Heat of Vaporization of Water in Liquor, B.t.u. (item 6) × [(item 26) + (item 27) × (item 20—212)]	1,826,320

(E) Incomplete Combustion of Carbon

35. Heat Evolved in Burning CO Equivalent to 1 lb. of Carbon to CO_2, B.t.u. From handbook	10,150

36. Carbon in Flue Gas as CO, pounds 15.7
$\frac{\%CO}{\%CO + \%CO_2} \times$ (item 18)

37. Incomplete Combustion Loss, B.t.u. 159,355
(item 35) × (item 36)

(F) Sensible Heat of Smelt

38. Inorganic Solids in Liquor, pounds 993
(item 7) × (item 5) ÷ 100

39. Total Inorganic Solids, pounds 1293
(item 10) + (item 38)

40. Specific Heat of Inorganics, B.t.u./pound/deg. F. 0.28
By determination, or handbook estimation

41. Heat of Fusion of Inorganics, B.t.u./pound 64
From handbook

42. Fusion Temperature, deg. F. 1,550
By pyrometer, or handbook estimation

43. Sensible Heat of Smelt, B.t.u. 618,054
(item 39) × [(item 41) + (item 40) × (item 42 — 70)]

(G) Endothermic Reduction of Salt Cake

44. Heat of Reduction of Na_2SO_4, B.t.u./pound 3,025
From handbook

45. Endothermic Heat of Reduction of Salt Cake, B.t.u. 907,500
(item 10) × (item 44)

(H) Generation of By-Product Steam

46. By-Product Steam Generated, pounds 9,318
Flowmeter readings

47. Pressure of Steam Generated, pounds 450
Pressure gage readings

48. Temperature of Steam Generated, deg. F. 650
From thermometers or thermocouples

49. Heat Content of Steam Generated, B.t.u./pound 1,330
From steam tables

50. Temperature of Feed Water, deg. F. 210
Thermometer readings

51. Sensible Heat of Feed Water, B.t.u./pound 178
(item 50) — 32

52. Heat Recovered in By-Product Steam, B.t.u. 10,734,336
(item 46) × (item 49 — item 51)

(J) Radiation and Unaccounted for

53. Radiation and Unaccounted for, B.t.u. 1,162,575
(item 14) — (items 22, 28, 33, 34, 37, 43, 45, 52)

Summary

(A) Heat Input

	Mill Results		*Typical Example*	
	Thousand B.t.u.	*Per Cent*	*Thousand B.t.u.*	*Per Cent*
14. Gross Heat Input System			18,490	100.00

(B) Heat Distribution

	Mill Results		*Typical Example*	
	Thousand B.t.u.	*Per Cent*	*Thousand B.t.u.*	*Per Cent*
22. Sensible Heat in Dry Flue Gas			2140	11.58
28. Hydrogen Combustion Loss			916	4.95
33. Sensible Heat Loss, Moisture in Intake Air			26	0.14
34. Evaporation of Water in Feed Liquor			1826	9.88
Total Flue Gas, Sensible and Latent Heat			4908	26.55
37. Incomplete Combustion Loss			159	0.86
43. Sensible Heat in Smelt			618	3.34
45. Endothermic Reduction of Salt Cake			908	4.91
52. Heat Recovered in By-Product Steam			10,734	58.05
53. Radiation and Unaccounted for			1163	6.29
Total			18,490	100.00

(C) Overall Efficiency

	Mill Results	*Typical Example*
54. Overall Efficiency of System, per cent		76.18
(items 34, 43, 45, 52) × 100 ÷ (item 14)		

The Relation Between Chip Length and Uniformity of Delignification in Sulphite Pulping*

By Howard Morgan[1] and Henry Philip Dixson, Jr.[2]

Abstract

The degree of delignification under normal cooking conditions varies greatly with chip length and the normal variations encountered in mill chips may be expected to give a wide variation in quality of pulp from different length chips.

Increasing the time to reach a temperature of 110 deg. C. in the cooking schedule from 1½ hours to 4 hours reduces the differences between short and long chips to some extent but does not give uniformity between different lengths which can be considered satisfactory. The use of high pressure from the start of the cook instead of following the normal pressure rise does reduce these differences to a reasonably suitable value and in addition gives an economic advantage of reduced cooking time.

Large non-uniformities exist in the degree of delignification obtained in different parts of the chip. Increasing the time at 110 deg. C. to 4½ hours gives only a very slight reduction in non-uniformity. High initial pressure which is maintained through the cooking cycle does give a marked improvement in uniformity of delignification.

Chip thickness, as well as length, has an important effect on the uniformity of penetration and cooking.

Introduction

In the sulphite process, the degree of delignification and the conditions under which it is accomplished are critical factors in determining the quality of pulp produced and the cost of production. That the degree of delignification varies greatly within a chip and between chips of different sizes and shapes is evident when undisintegrated cooked chips are examined. It is apparent that the pulp produced, though its average degree of cooking and quality may be optimum, is made up of over-cooked and under-cooked fibers. If all fibers could be cooked to the optimum point, an improvement in quality and economies of the average pulp produced over those obtained when the average consists of over- and under-cooked fibers would be accomplished. It is realized that this ideal may not be practically feasible but a result approaching it should be.

This work was undertaken to study the effect of variables of chip length and, in a limited way, that of digestion pressure on uniformity of delignification. In the manufacture of sulphite pulp it is important to use cooking conditions that will give as near a uniform degree of delignification as possible for all chips of lengths from ½ to 1¼ inches. Most commercial chips, while cut to give the majority at a definite length to which the cooking schedule is adjusted, have smaller fractions varying within the above limits. Many studies have been made on the penetration of chips by sulphite cooking acid, but they have principally, if not entirely, been concerned with either the results accomplished as measured on an average sample of the pulp produced or on the degree and uniformity of penetration of the acid into the chips as determined by examination of chips removed from the digestion relatively early in the cycle. In this study the variation in degree of cooking within a chip was determined on chips that had been through an entire cooking cycle.

By measuring the degree of delignification of the center and end portions of a chip, it was possible to evaluate the effect of variations in chip length on uniformity of delignification, as well as on the average degree of cooking.

Experimental

Prior to cooking, the chips were accurately classified as to size by careful measurement. After cooking, the digester pressure was relieved, the cooking liquor drained, the chips carefully removed without appreciable disintegration, and allowed to wash by diffusion in large volumes of water overnight. A portion of the chips were completely disintegrated by vigorous agitation to give a sample of pulp average for that size. The chips in another portion were cut across their length to give three equal sections —two end sections and a middle section. The two end sections were combined and both samples disintegrated. The three samples, average, end, and middle of the chips, were again thoroughly washed. The permanganate number was used as a measure of degree of delignification of samples of the average pulp for each chip size and of the samples representing the end and middle sections of chips in each size fraction.

It will be realized that the sectioning of chips used here does not give a separation of maximum extremes in degree of delignification, for the degree of delignification varies continuously from the edges to the center of the chip. It does, however, give a valuable arbitrary measure of the degree of uniformity accomplished in cooking. From the results obtained it is possible to evaluate the effect of chip length on the average degree of delignification obtained and the degree of non-uniformity in each size of chip.

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A portion of a thesis submitted in partial fulfillment of the requirements of The Institute of Paper Chemistry for the degree of Master of Science from Lawrence College, Appleton, Wis., June, 1937.

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[2] Graduate Student, The Institute of Paper Chemistry.

Conditions and Procedures

Freshly cut red spruce wood, seasoned to the average moisture content of 38 per cent, was used for all experiments. Sticks were selected which showed approximately the same rate of growth and age. The wood was 40 years old, with an annual increase in diameter of 0.175 inch. The specific gravity of the dry wood was 0.43.

A semi-commercial chipper was used to prepare the chips. The chipper blades could be adjusted to produce one-half, three-fourths, one, and one and one-fourth inch chips.

The bisulphite cooking liquor used was made from slaked lime, water, and commercial liquid sulphur dioxide. The combined sulphur dioxide was 1.25 ± 0.02 per cent for all cooks. The free sulphur dioxide was maintained at 4.5 ± 0.02 per cent. A liquor to o. d. chip weight ratio of 4.5 to 1 was used.

A stainless steel experimental digester equipped with indirect heating and forced circulation was used. This digester is designed and equipped with controls to allow the duplication of commercial cooking conditions and permits the regulation of temperature schedules to ± 1 deg. C. and the pressure schedule to ± 2 pounds.

One-half, three-fourths, one, and one and one-fourth inch chips were cut for all experiments. The chips were stored in air-tight containers, so that the moisture content would not change. Each chip used was measured for length and thickness. The chips were graded according to the specifications given below. All odd-shaped chips were discarded.

½ inch chips:
Length ½ inch; tolerance $\frac{1}{16}$ inch.
Thickness not measured.

¾ inch chips:
Length ¾ inch; tolerance $\frac{1}{16}$ inch.
Thickness:
Class I—⅛ inch or less thick.
Class II—over ⅛ inch thick.

1 inch chips:
Length 1 inch; tolerance $\frac{1}{16}$ inch.
Thickness:
Class I—⅛ inch or less thick.
Class II—$\frac{1}{16}$ inch to ⅛ inch thick.
Class III—over $\frac{1}{16}$ inch thick.

1¼ inch chips:
Length 1¼ inch; tolerance $\frac{1}{16}$ inch.
Thickness:
Class I—⅛ inch or less thick.
Class II—$\frac{1}{16}$ to ⅛ inch thick.
Class III—over $\frac{1}{16}$ inch thick.

The percentages by weight of the various classes in a given length of chip were determined, so that a permanganate number could be calculated for the entire group from the permanganate number of each class of chips.

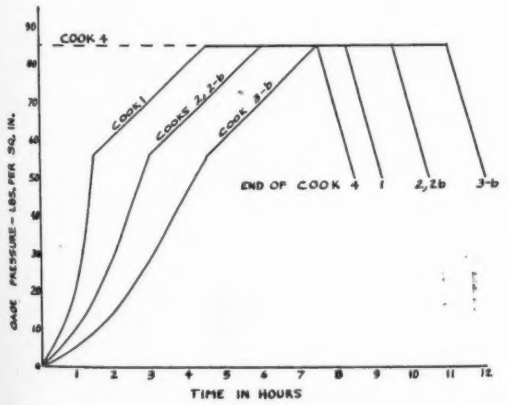


FIG. 1
Pressure curves obtained in the different cooks.

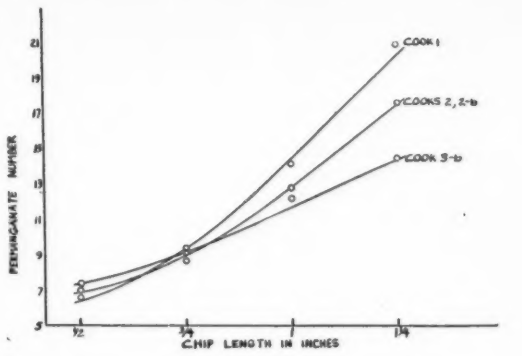


FIG. 2
Relation between the permanganate number of the pulp and the chip length.

The measured chips were stored under conditions which prevented any appreciable change in moisture content and were cooked at moisture contents of from 38 to 40 per cent.

Sufficient unmeasured chips to give with the measured fractions a full digester charge were placed in the digester. The layers of each size fraction of chips, separated by stainless steel wire screen, were placed on top of these chips, the top layer being submerged by a perforated plate.

The temperature schedules employed are given in Table I. A straight line rise from 30 to 110 deg. C. and from 110 to 140 deg. C. was employed. The time at 140 deg. C. was varied to give an average permanganate number of approximately 9.0 on the ¾ inch chips.

TABLE I—COOKING SCHEDULES

Cook No.	Penetration time, hr.-min.	Time from 110 to 140° C., hr.-min.	Time at 140° C., hr.-min.	Total length of cook, hr.-min.
1	1:30	4:45	3:15	9:30
2	3:00	4:45	2:45	10:30
3	4:30	4:45	2:25	11:40
3b	4:30	4:45	2:45	12:00
4	1:30	4:45	2:15	8:30

The pressure schedules of the several cooks are plotted in Fig. 1. These followed a normal rate of rise, so that the pressure reached 57 pounds at the same time the temperature reached 110 deg. C.; they were then held to a straight line rise to 85 pounds in the next 3 hours. During the last hour of the cook the pressure was relieved to 50 pounds. At the end it was rapidly dropped by relief of gas and liquor to 0 pressure. Cook No. 4 was made with an initial pressure of 85 pounds, which was maintained throughout until time for relief. Cook No. 2b was made as a check on cook No. 2. Cook No. 3 did not give the desired degree of cooking and No. 3b was a repeat, in which the time at 140 deg. C. was varied to give the desired degree of cooking. The data from cook No. 3 are not included in this discussion.

The permanganate number was determined by the TAPPI tentative standard method (T 214m-37) on samples prepared as previously described and disintegrated in a Koerner type disintegrator. The pulp samples were not screened, since knots and abnormal shaped chips had been removed and screenings would only be the result of insufficient cooking.

Results and Discussion

The results on average permanganate numbers

(Table II, Fig. 2) show that the degree of delignification does vary greatly with length of chip. With a rapid rise in temperature (cook No. 1) the longer chips give very poor delignification. Increasing the time to 110 deg. C. over the normal range for quick cook sulphite — 1½ hours to 4½ hours — increased the uniformity between different chip lengths but even 4½ hours (cook 3b) leaves considerable to be desired. In this cook the permanganate number varied from 7.3 for the ½ inch chips to 14.3 for the 1¼ inch chips. The pulp with a permanganate number of 7.3 would be overcooked and of low yield, while that of 14.3 would be hard bleaching, and a bleaching treatment sufficient to bring it to a satisfactory white would seriously degrade the quality of the 7.3 permanganate number pulp.

TABLE II

Permanganate numbers of pulps from different length chips cooked under varying penetration periods. (Whole chips, all thicknesses.)

	Cook No.				
	1	2	2b	3b	4*
Penetration time (hours)...	1.5	3.0	3.0	4.5	1.5
Chip length (inches)					
½	6.4	6.4	7.7	7.3	9.0
¾	9.1	8.6	8.3	9.3	8.8
1	14.0	12.3	13.1	12.3	10.3
1¼	20.9	17.4	17.6	14.3	11.9

* High initial pressure.

Not only is this increase in time to 110 deg. C. inadequate from the point of uniformity of pulp for different chip lengths, but also it increases the total cooking time over that of cook No. 2, which might be considered normal practice, by 1½ hours, thereby reducing mill production and increasing operating cost.

The effect of high initial pressure is graphically shown in Fig. 3. Using the same time to 110 deg. C. as was used in cook No. 1 (1½ hours) and adjusting the total time to give a comparable permanganate number on the ¾ inch chips the difference between ½ inch chips and 1¼ inch chips was reduced from 14.5 (cook 1) to 2.9. The total cooking time was also reduced by 1 hour. It is felt that the uniformity between different lengths is sufficient to obviate most of the undesirable effects encountered due to chip length variation. The reduction in total time represents an operating economy due to greater mill production.

The differences in degree of delignification between the center and ends of the chips as determined on the samples made from sectioned chips are given in Table III and are plotted in Fig. 4. These results show a marked increase in non-uniformity of chip length as the chip length is increased when the normal pressure schedules are used with the samples that are the averages of all thicknesses, both the 1 and 1¼ inch have differences of over 4 in permanganate number regardless of the time used to reach 110 deg. C. The chips ⅛ inch or less in thickness show a much better uniformity and those over ⅛ inch an appreciably poorer uniformity. Increasing the time to 110 deg. C. from 1½ hours (cook No. 1) to 4½ hours (cook 3b) does not appreciably increase the uniformity of delignification either for the chips for the average samples or the chips over ⅛ inch in thickness; for those ⅛ inch or less in thickness, the uniformity is improved by increasing the time from 1½ hours to 3 hours. The use of high initial pressure shows a marked improvement in uniformity for chips of all lengths and thicknesses studied. With the ½ and ¾ inch chips, the normal commercial range, the difference between inner and outer sections is less than one permanganate number.

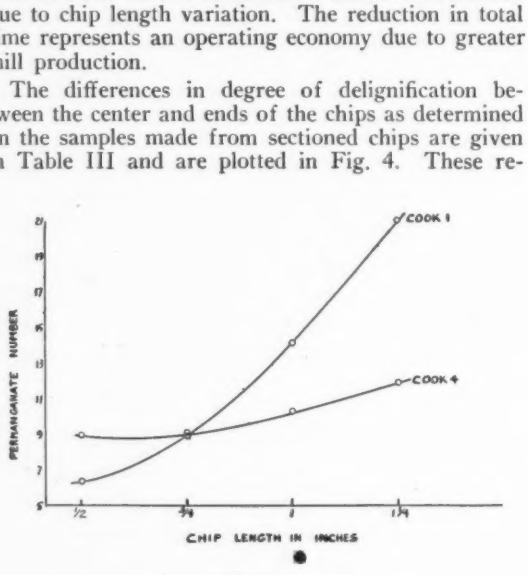


FIG. 3

Effect of using high initial pressure in cooking.

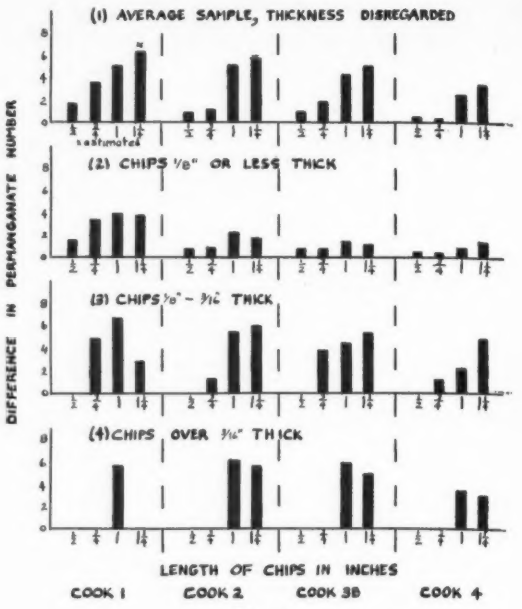


FIG. 4

Difference in Permanganate Number between end and center sections of chips of various lengths and thicknesses.

TABLE III

Permanganate numbers of pulps prepared from end and center sections of chips sorted in respect to length and thickness.

Chip length, inches	Thickness Class	Section	Permanganate number			
			Cook 1	Cook 2	Cook 3b	Cook 4
½	I	end	6.3	6.0	6.7	9.1
		center	8.1	6.8	7.6	8.8
¾	I	end	8.1	7.1	7.4	8.9
		center	10.4	8.0	8.4	8.8
	II	end	9.5	7.6	9.1	8.5
		center	14.1	8.9	13.1	9.5
1	I	end	11.3	10.1	8.7	9.5
		center	15.2	12.2	10.5	10.4
	II	end	11.2	11.9	10.0	9.9
		center	17.7	17.6	14.4	12.0
	III	end	13.2	13.5	10.8	10.4
		center	18.7	19.5	16.7	14.0
1¼	I	end	11.3	12.7	9.4	9.1
		center	14.3	14.2	11.0	10.6
	II	end	15.1	14.6	11.0	10.5
		center	18.9	20.6	16.6	15.3
	III	end	...	16.9	14.7	13.8
		center	...	22.4	19.6	16.8

Imports of Paper and Paper Stock

Giving Manifests of New York, Boston, Philadelphia and Other Ports, of Newsprint, Wrapping, Writing, Coated, Blotting, Tissue, Strawboard, Wallboard, Cigarette Papers, Sulphite, Kraft and Ground Wood Pulp.

NEW YORK IMPORTS

WEEK ENDING AUGUST 13, 1938

SUMMARY

Cigarette paper	702 cs.
Wall paper	6 bls.
Newsprint	12,763 rolls
Printing paper	80 cs.
Wrapping paper	384 rolls, 242 bls.
Packing paper	8 cs.
Drawing paper	5 cs.
Filter mass	3 cs.
Filter paper	11 cs.
Surface baryta coated paper	260 crates, 21 cs.
Surface coated paper	25 cs.
Foil paper	4 cs.
Basic paper	52 cs.
Photo paper	12 cs.
Decalcomania paper	4 cs., 5 drums
Decalcomanias	4 cs.
Transfer pictures	2 cs.
Tissue paper	24 cs.
Crepe paper	6 ctns., 6 cs.
Copying paper	3 cs.
Writing paper	1 cs.
Transparent paper	15 cs.
Tracing cloth	20 cs.
Gummed paper	6 cs.
Paper boards	17 cs.
Paper tubes	61 ctns., 94 cs.
Miscellaneous paper	95 bls., 10 cs.

CIGARETTE PAPER

De Mauduit Paper Corp., *Champlain,* Havre, 2 cs.
Champagne Paper Corp., *Champlain,* Havre, 405 cs.
Champagne Paper Corp., *Collamer,* Havre, 295 cs.

WALL PAPER

Hudson F'd'g Co., *Champlain,* Havre, 6 bls.

NEWSPRINT

Jay Madden Corp., *Deutschland,* Hamburg, 200 rolls.
International Paper Sales Co., *Tyrifjord,* Dalhousie, 2,407 rolls.
Jay Madden Corp., *Rydboholm,* Viipuri, 180 rolls.
International Paper Co. *G.T.D.,* Gatineau, 315 rolls.
H. G. Craig Co., Inc., *G.D.D.,* Donnacona, 433 rolls.
N. Y. Evening Journal, *Hammaren,* Sweden, 1,630 rolls.
Gilman Paper Co., *Hammaren,* Sweden, 379 rolls.
Brooklyn Daily Eagle, *Hammaren,* Sweden, 72 rolls.
——, *Hammaren,* Sweden, 73 rolls.
News Syndicate Co. Inc., *Louisianan,* Comeau Bay, 5,792 rolls.
Perkins Goodwin & Co., *Hamburg,* Hamburg, 130 rolls.
Jay Madden Corp., *Hamburg,* Hamburg, 443 rolls.
H. G. Craig Co., Inc., *G.D.D.,* Donnacona, 347 rolls.
H. G. Craig Co., Inc., *A.C.D.,* Donnacona, 362 rolls.

PRINTING PAPER

Pomerance & Co., *American Trader,* London, 9 cs.
E. Dietzgen & Co., *Hamburg,* Hamburg, 46 cs.
L. A. Consmiller, *Europa,* Bremen, 25 cs.

WRAPPING PAPER

Heemsoth Kerner Corp., *Deutschland,* Bremen, 23 bls.
——, *Kungsholm,* Gothenburg, 384 rolls, 219 bls.

PACKING PAPER

——, *Black Tern,* Rotterdam, 5 cs.
British American Toffee Co., *Maasdam,* Rotterdam, 3 cs

DRAWING PAPER

Devoe & Raynolds Co., Inc., *American Trader,* London, 3 cs.
H. Reeve Angel & Co., Inc., *American Trader,* London, 2 cs.

FILTER MASS

A. Giese & Son, *Deutschland,* Hamburg, 3 cs.

FILTER PAPER

H. Reeve Angel & Co., Inc., *American Trader,* London, 6 cs.
——, *Deutschland,* Hamburg, 4 cs.
——, *Maasdam,* Rotterdam, 1 cs.

SURFACE BARYTA COATED PAPER

Globe Shipping Co., *Deutschland,* Hamburg, 1 cs., 159 crates.
Globe Shipping Co., *Hamburg,* Hamburg, 11 cs. 101 crates.
Dingelstedt & Co., *Gerolstein,* Antwerp, 9 cs.

SURFACE COATED PAPER

Gevaert Co., of America, *Black Osprey,* Antwerp, 25 cs.

FOIL PAPER

K. Pauli Co., *Hamburg,* Hamburg, 4 cs.

BASIC PAPER

Globe Shipping Co., *Deutschland,* Bremen, 51 cs.
Dingelstedt & Co., *Gerolstein,* Antwerp, 1 cs.

PHOTO PAPER

Heemsoth Kerner Corp., *Deutschland,* Hamburg, 2 cs.
J J. Gavin Co., *Queen Mary, Southampton,* 8 cs. (unsensitized).
Medo Photo Supply Co., *Samaria,* Liverpool, 2 cs.

DECALCOMANIA PAPER

B. F. Drakenfeld & Co., *Samaria,* Liverpool, 4 cs., 5 drums, (duplex).

DECALCOMANIAS

Sellers Transportation Co., *Europa,* Bremen, 4 cs.

TRANSFER PICTURES

Rohner Gehrig & Co., *Europa,* Bremen, 2 cs.

TISSUE PAPER

Atlantic F'd'g Co., *Deutschland,* Hamburg, 24 cs.

CREPE PAPER

Phoenix Shipping Co., *Deutschland,* Hamburg, 6 ctns.
International F'd'g Co., *Deutschland,* Hamburg, 6 cs.

COPYING PAPER

E. Dietzgen & Co., *Samaria,* Liverpool, 2 cs.
Roneo Co., Inc., *American Trader,* London, 1 cs.

WRITING PAPER

Harold Mayer, *Deutschland,* Hamburg, 1 cs.

TRANSPARENT PAPER

Gallagher & Ascher, *Kungsholm,* Gothenburg, 15 cs.

TRACING CLOTH

C. Bruning Co., Inc., *Europa,* Bremen, 20 cs.

GUMMED PAPER

Heemsoth Kerner Corp., *Europa,* Bremen, 6 cs.

PAPER BOARDS

Steiner Paper Corp., *Deutschland,* Hamburg, 11 cs.
Steiner Paper Corp., *Hamburg,* Hamburg, 6 cs.

PAPER TUBES

——, *Deutschland,* Bremen, 30 cs., 61 ctns.
——, *Hamburg,* Hamburg, 64 cs.

MISCELLANEOUS PAPER

National City Bank, *Kyusyu Maru,* Yokohama, 10 cs.
Kraemer & Co., *Kungsholm,* Gothenburg, 95 bls.

RAGS, BAGGINGS, ETC.

R. Blank, *Exeter,* Alexandria, 74 bls. old cottons.
E. J. Keller Co., Inc., *Exeter,* ———, 232 bls. paper stock.
Chase National Bank, *Deutschland,* Hamburg, 309 bls. bagging.
Hughes Fawcett, Inc., *Caledonia,* Glasgow, 79 bls. flax waste.
Chase National Bank, *Lehigh,* Liverpool, 38 bls. bagging.
Chase National Bank, *Olga S.,* London, 18 bls. paper stock.
Keene, Inc., *Olga S.,* Antwerp, 77 bls. rags.
———, *Samaria,* Liverpool, 43 bls. rags.
Chase National Bank, *Samaria,* Liverpool, 56 bls. bagging.
Hughes Fawcett, Inc., *Black Osprey,* Antwerp, 26 bls. rayon waste.
W. Steck & Co., *Pan America,* Buenos Ayres, 140 bls. rags.
Castle & Overton, Inc., *Black Tern,* Rotterdam, 65 bls. bagging.
———, *E. Francqui,* Antwerp, 59 bls. flax waste.
———, *Gerolstein,* Antwerp, 25 bls. cotton waste.
Wertheimer Bag Co., *Fort Townshend,* Halifax, 110 bls. bagging.
Chase National Bank, *Collamer,* Havre, 242 bls. bagging.
———, *Collamer,* Havre, 15 bls. rags.
Manufacturers Trust Co., *Collamer,* Dunkirk, 57 bls. rags.
E. J. Keller Co., Inc., *Sarcoxie,* ———, 140 bls. bagging.

OLD ROPE

W. Steck & Co., *Olga S.,* London, 60 coils.
Banco Coml Italiane Trust Co., *Olga S.,* London, 55 coils.
G. W. Millar & Co., Inc., *Olga S.,* Rotterdam, 61 coils.
Chase National Bank, *American Trader,* London, 54 coils.
Banco Coml Italiane Trust Co., *American Trader,* London, 42 coils.
Chase National Bank, *Gloucester City,* Bristol, 106 coils.
W. Steck & Co., *N. Amsterdam,* Rotterdam, 95 coils.
W. Steck & Co., *Collamer,* Dunkirk, 111 coils.

WOOD PULP

———, *Deutschland,* Hamburg, 280 bls. sulphite, 56 tons.
Pulp Sales Corp., *Rydboholm,* Rauma, 2,175 bls. sulphite.
Pulp Sales Corp., *Rydboholm,* Viipuri, 3,100 bls. sulphite, 1,000 bls. sulphate.
Pulp Sales Corp., *Rydboholm,* Trangsund, 1,270 bls. sulphate.
M. Sone, *Hammaren,* Stockholm, 600 bls. sulphite.
Price & Pierce, Ltd., *Hammaren,* Sweden, 600 bls. sulphite.
E. M. Sergeant Pulp & Chemical Co., *Hammaren,* Sweden, 500 bls. sulphite.
Bank of N. Y. Trust Co., *Hammaren,* Sweden, 3,000 bls. sulphite.
Absorbo Beer Pad Co., *Saturnia,* Trieste, 1148 bls. wood pulp.
Bank of N. Y. Trust Co., *Hamburg,* Hamburg, 280 bls. wood pulp, 56 tons.
D. M. Hicks, Inc., *Kungsholm,* Gothenburg, 600 bls. sulphite.
———, *Europa,* Bremen, 135 bls. wood pulp.
M. Sone, *Tunaholm,* Stockholm, 299 bls. wood pulp.

WOOD PULP BOARDS

Jay Madden Corp., *Rydboholm,* Viipuri, 44 bls. 185 rolls.
———, *Rydboholm,* Viipuri, 350 rolls.
———, *Deutschland,* Hamburg, 13 cs. (sheets).

ALBANY IMPORTS

WEEK ENDING AUGUST 13, 1938

Price & Pierce, Ltd., *Rydboholm,* Stockholm, 600 bls. bleached sulphite.
Bulkley Dunton Pulp Co., Inc., *Rydboholm,* ———, 1,800 bls. sulphite.
Pulp Sales Corp., *Rydboholm,* Rauma, 728 bls. sulphite, 430 bls. sulphate.
Pulp Sales Corp., *Rydboholm,* Viipuri, 2,010 bls. sulphite, 360 bls. sulphate.
Pulp Sales Corp., *Rydboholm,* Trangsund, 2,159 bls. sulphate.
International Paper Co., *Nandi,* Sheet Harbor, 1,350 cords pulpwood.
———, *Ada,* Sheet Harbor, 10,425 bls. mechanically ground pulp, 2,329 tons.

BOSTON IMPORTS

WEEK ENDING AUGUST 13, 1938

E. J. Keller Co., Inc., *Black Tern,* ———, 183 bls. rags.
D. C. Andrews & Co., *Black Tern,* Antwerp, 19 bls. cotton waste.
Continental Bank Trust Co., *Anna Macrsk,* Kobe, 100 bls. hemp waste.
J. E. Smith, *Collamer,* Havre, 24 bls. cotton waste.
Castle & Overton, Inc., *Collamer,* Havre, 196 bls. rags.
E. J. Keller Co., Inc., *Collamer,* ———, 82 bls. bagging.
———, *Collamer,* Dunkirk, 25 bls. rags.
M. Sone, *Tunaholm,* Gothenburg, 299 bls. wood pulp.
Price & Pierce, Ltd., *Mormacsun,* ———, 300 bls. bleached sulphite.

PHILADELPHIA IMPORTS

WEEK ENDING AUGUST 13, 1938

Philadelphia National Bank, *Lehigh,* Liverpool, 542 bls. bagging.
Philadelphia National Bank, *Olga S.,* London, 7 bls. rags.
Philadelphia National Bank, *Black Osprey,* Antwerp, 45 bls. rags.
J. M. Hagy Waste Works, *Vito,* Kobe, 55 bls. rags.
———, *Ada,* Sheet Harbor, 2,751 bls. mechanically ground pulp, 614 tons.
Bank of N. Y. Trust Co., *Maasdam,* Rotterdam, 762 bls. unbleached sulphate.

BALTIMORE IMPORTS

WEEK ENDING AUGUST 13, 1938

———, *Lehigh,* Liverpool, 77 coils old rope.
S. Shapiro & Son, *Vito,* Kobe, 21 bls. rags.
Gottesman & Co., Inc., *Kexholm,* Sweden, 810 bls. unbleached sulphite.

NORFOLK IMPORTS

WEEK ENDING AUGUST 13, 1938

———, *Lehigh,* Liverpool, 500 bls. bagging.
Lehigh Textile Co., *Lehigh,* Manchester, 49 bls. bagging.
Perkins Goodwin & Co., *Maasdam,* Rotterdam, 140 bls. sulphate.
Gottesman & Co., Inc., *Yngaren,* Sweden, 6,370 bls. unbleached sulphite.

NEW ORLEANS IMPORTS

WEEK ENDING AUGUST 13, 1938

M. Sone, *Oakwood,* Hamburg, 316 bls. wood pulp.

MONTREAL IMPORTS

WEEK ENDING AUGUST 13, 1938

Gottesman & Co., Inc., *Dalmore,* Sweden, 6,710 bls. unbleached sulphite.

Cohoes Folding Box Co. Formed

[FROM OUR REGULAR CORRESPONDENT]

COHOES, N. Y., August 15, 1938—A new concern to be known as the Cohoes Folding Box Company has announced plans for starting operations here with a lease of a plant on Canvas street. The company has contracted to take over space on the first floor of the Boswell & Davidson building and will occupy several thousand square feet of space. Installation of machinery for making folding boxes will begin immediately and production will be started as soon as possible. The company will manufacture folding boxes and display cards. About 25 persons will be employed at the start but later on the force will be increased.

American Paper Products Gets Insurance

A group life insurance policy involving a total of $57,500 and granting insurance to 50 employees has recently been acquired by the American Paper Products Company, of East Liverpool, Ohio.

The policy, issued by the Prudential Insurance Company of America on the contributory basis, provides that each worker is eligible to coverage in amounts ranging from $1,000 to $2,500, according to rank.

The premiums will be shared by the employees and the employing company.

New York Market Review

Office of the PAPER TRADE JOURNAL,
Wednesday, August 17, 1938.

The trend in demand for practically all grades of paper is apparently upward and the prevailing opinion in the wholesale paper trade seems to be that distribution is as active as could be expected for what is normally one of the dullest months in the year. The index of general business activity stands at 75 per cent, compared with 73 per cent for last week and with 100 per cent for the corresponding period in 1937. The average production ratio for 210 reporting paper mills stood at 71 per cent for the week of August 6, compared with 77 per cent for the week of July 30, and with 82 per cent for the week of August 7, 1937. Distribution of some grades of paper is reported about on a balance with production, though the demand for other grades is well below this level.

In general, the opinion is commonly expressed in the paper industry that the improvement now in evidence in the dull weeks of the year, is an encouraging sign for a substantial increase in activity during early fall.

The extremely hot weather throughout a large part of the country has had some adverse effect on the wholesale paper market. The demand for some grades, however, is relatively good. Production and distribution of kraft paper continue to be maintained at a high level, with production reported this week as nearing capacity. The current price level for kraft paper is causing some concern, due to the continuance of the practice of making price concessions under the representative quoted market quotations. Prices in general continue to hold firm and while kraft prices are none too firm, no change in representative quoted market prices are reported for the current week. The box board market continues to show improvement. Prices of all grades of board, while not firm, continue unchanged at prevailing quotations.

Mechanical Pulp

The demand for mechanical pulp continues light, but the slight improvement, reported in some quarters of the trade, is held to indicate an upward trend for next month. Prices continue unchanged on standard grades of domestic and foreign pulps.

Chemical Pulp

Business in the chemical pulp market is reported as light for the week. The price situation of bleached sulphite has been somewhat confused by various reports of a reduction in price, in a few instances, of about $5 per ton. This reduction, however, is generally considered in the trade as of no particular importance and as merely a price concession for relative small lots of pulp, most of which is held to be not of the highest quality. Small lots of various grades of pulp are frequently reported under the market, and most of it is resale business.

The representative quoted market prices on all standard grades of domestic and imported pulp continue relatively firm. Prime bleached sulphite, domestic and foreign, is currently quoted at $50 to $60 per ton, easy bleaching at $43 to $45, and strong unbleached at $37 to $43. Imported bleached kraft is quoted at $55 to $60, light and strong kraft at $40 to $43, and No. 1 kraft at $37 to $40 per ton, on dock at Atlantic ports. The average representative quoted market price on domestic or southern kraft is $35 to $45 per ton, f.o.b., pulp mill. Varying lots of pulp of lower quality have been reported under the above prices.

Old Rope and Bagging

Business in old rope continues light. No change in representative quoted market prices is reported this week. No change in demand or prices has occurred in old bagging this week. Prices are unchanged and conform to prevailing quotations.

Rags

Demand for new and old domestic rags continue light for the week. Prices remain firm and no change is reported this week. The foreign rag market continues inactive. Prices are nominal.

Waste Paper

A little improvement is reported in some grades of waste paper for the week. Prices on all grades continue quite firm. No changes in prices are reported for the week, with the exception of old kraft, compressed bales which is higher for this week and currently quoted at from .85 to .90.

Twine

The demand for twine is reported as rather light for this week. Prices on all grades of hard and soft fiber twines remain relatively firm and no changes in representative quoted market prices are reported for the current week.

Ottawa Plant Installs Dilts Hydrafiners

The J. R. Booth Company of Ottawa, Canada, has just purchased two Hydrafiners from the Dilts Machine Works, Inc., Fulton, N. Y. It is understood that these units are to be put into immediate operation at the Ottawa mill and will work in conjunction with their present system.

The Booth Company is using the new Hydrafiners to supplement its present beater system. With this installation it is expected that the company will effect a substantial reduction in power costs and at the same time increase the quality of its product and the efficiency of operation.

Miscellaneous Markets

Office of the PAPER TRADE JOURNAL,
Wednesday, August 17, 1938.

BLANC FIXE—Quotations on blanc fixe are firm and unchanged at prevailing prices. The pulp is offered at from $42.50 to $45 per ton, in bulk; the powder is quoted at from 3½ to 3¾ cents per pound, in barrels, at works.

BLEACHING POWDER—The price of bleaching powder is unchanged and conforms to prevailing quotations. Bleaching powder is quoted at from $2 to $2.25 per 100 pounds, in drums, at works.

CASEIN—The demand for casein is reported as quite active. Domestic ground casein is quoted at from 9 to 10 cents per pound; domestic finely ground at from 9½ to 10 cents per pound. All prices in bags, car lot quantities.

CAUSTIC SODA—Prices of caustic soda continue unchanged and conform to prevailing quotations. Solid caustic soda is quoted at from $2.10 to $2.30 per 100 pounds; flake and ground at from $2.50 to $2.70 per 100 pounds, in drums, at works.

CHINA CLAY—The demand for china clay continues moderate. Prices are firm and continue unchanged at prevailing quotations. Imported clay is quoted at from $14.50 to $25 per ton, ship side. Domestic filler clay is quoted at from $6.50 to $12 per ton; coating clay at from $11 to $22 per ton, at mines.

CHLORINE—Quotations on chlorine continue firm and unchanged at prevailing prices. Chlorine is offered at $2.15 per 100 pounds, in single-unit tank cars, f.o.b., works.

ROSIN—The demand for rosin is reported as good for the current week. "G" gum rosin is quoted at $4.55; "FF" wood rosin at $4.55 per 280 pounds, gross weight, in barrels, at Savannah. Seventy per cent gum rosin size is offered at $2.62 per 100 pounds, f.o.b., shipping point.

SALT CAKE—Quotations on salt cake are firm and conform to prevailing prices. Quotations range at from $12 to $13.50 per ton; chrome salt cake at from $11 to $12 per ton, f.o.b., shipping point. Imported salt cake is quoted at from $14.50 to $15 per ton, Gulf or Atlantic Seaboard, on dock.

SODA ASH—Quotations on soda ash continue firm and unchanged at prevailing prices. Quotations on soda ash in car lots, at works, per 100 pounds, are as follows: in bulk, $.90; in bags, $1.05; and in barrels, $1.35.

STARCH—The corn starch market is reported as soft for the current week. Globe pearl is quoted at $2.45 per 100 pounds, in bags, and at $2.70 in barrels. Special paper starch is quoted at $2.55 per 100 pounds, in bags, and $2.80 in barrels; all prices in car lots, f.o.b., Chicago.

SULPHATE OF ALUMINA—Quotations on sulphate of alumina are firm and unchanged at prevailing prices. The commercial grades are quoted at $1.15; iron free at $1.30 per 100 pounds, in barrels, car lot quantities, f.o.b., works.

SULPHUR—The prices of sulphur are firm and conform to prevailing quotations. Annual contracts are quoted at $18 per long ton, f.o.b., cars at mines. Spot and nearby car lots are offered at $21 per ton.

TALC—The prices of talc continue firm and unchanged at prevailing quotations. Domestic talc is quoted at from $15 to $18 per ton, Eastern mines. Imported talc is offered at from $25 to $40 per ton, on dock.

Market Quotations

Mechanical Pulp

(Delivered New York)

News, per ton—			
Roll, contract	$50.00	@	—
Sheets	58.00	@	—
Kraft—per cwt.—Delivered Zone A			
No. 1 Northern	$5.25	@	—
Superstandard	4.12½	@	5.00
Northern Standard Wrapping	4.50	@	—
Standard Wrapping	4.00	@	—
Tissues—Per Ream—Carlots			
White No. 1	.92½	@	—
White No. 1 M. G.	.90	@	—
White No. 1½	.67½	@	—
White No. 2	.60	@	—
Anti-Tarnish M. G.	.75	@	—
Colored	.87½	@	—
Kraft	.75	@	—
Manila	.60	@	—
Unbl. Toilet, 1 M.	3.20	@	—
Bleached Toilet	5.26	@	—
Paper Towels—			
Unbleached	1.80	@	—
Bleached	2.10	@	—
Manila—per cwt.—C. l. f. a.			
No. 1 Jute	$8.25	@	$9.75
No. 2 Jute	7.50	@	9.00
No. 1 Manila Wrapping, 35 lb.	5.00	@	—
No. 2 Manila Wrapping, 35 lb.	4.75	@	—
Boards, per ton—			
News	$27.50	@	$30.00
Chip	27.50	@	30.00
Sgl. Mla. Lt. Chip.	42.50	@	—
Jute Lined Chip	42.50	@	45.00
White Pat. Coated.	55.00	@	57.50
Kraft Liners	42.50	@	50.00
Binders Boards	71.00	@	77.00

The following are representative of distributors' resale prices:—

Rag Content Bonds and Ledgers—
White, Assorted Items,
Delivered in Zone 1:

	Bonds	Ledgers
100% Rag Ext. No. 1.	$39.10@$46.00	$40.25@$47.25
100% Rag	31.05@ 36.50	32.20@ 37.75
85% Rag		29.90@ 35.00
75% Rag	23.60@ 27.75	24.75@ 29.00
65% Rag		21.65@ 26.25
50% Rag	17.55@ 21.50	18.70@ 22.75
25% Rag	14.65@ 17.75	15.80@ 19.25

Colors at $1.00 cwt. extra

Sulphite Bonds and Ledgers—
White, Assorted Items,
Delivered in Zone 1:

	Bonds	Ledgers
No. 1	$8.80@$10.75	$9.95@$12.00
No. 2	7.90@ 9.50	9.05@ 11.00
No. 4	7.00@ 8.50	8.20@ 10.00

Colors $1.00 cwt. extra.

Free Sheet Book Papers—
White, Cased Paper,
Delivered in Zone 1:

No. 1 Glossy Coated	$10.80	@$12.25
No. 2 Glossy Coated	9.25	@ 10.50
No. 3 Glossy Coated	8.15	@ 9.25
No. 4 Glossy Coated	7.65	@ 8.75
No. 1 Antique (watermarked)	7.65	@ 8.75
No. 2 Offset	7.00	@ 8.00
A Grade E. F.	6.80	@ 7.75
A Grade S. & S. C.	7.05	@ 8.00
B Grade E. F.	6.25	@ 7.25
B Grade S. & S. C.	6.50	@ 7.50
C Grade E. F.	6.00	@ 7.00
C Grade S. & S. C.	6.25	@ 7.25
D Grade E. F.	5.70	@ 6.75
D Grade S. & S. C.	5.95	@ 7.00

Ivory & India at $.50 cwt. extra.

Paper

(On Dock, Atlantic Ports)

No. 1 Imported—			
Moist	27.00	@	30.00
Dry	27.00	@	30.00
(Delivered)			
No. 1 Domestic and Canadian	29.00	@	33.00

Chemical Pulp

(On Dock, Atlantic, Gulf and West Coast Ports)

Bleached Sulphite (Domestic and Foreign)—			
Prime Bleached Sulphite	2.50	@	3.00
Prime Qualities—			
Easy-Bleaching Sulphite	2.15	@	2.25
Strong Unbleached Sulphite	1.85	@	2.15
(On Dock, Atlantic Ports)			
Kraft Bleached	2.75	@	3.00
Kraft Light & Strong	2.00	@	2.15
Kraft No. 1	1.85	@	2.00
Kraft No. 2	1.65	@	1.80
(F.o.b. Pulp Mill)			
Kraft Domestic	1.75	@	2.25
(Delivered)			
Soda Bleached	2.70	@	—

Add 60 cents per short ton, dock charges for Albany; $2.50 for Lake Ports East and $3.50 for Lake Ports West of Mackinac Straits.

Domestic Rags

New Rags

(Prices to Mill f. o. b. N. Y.)

Shirt Cuttings—			
New White, No. 1.	6.75	@	7.00
Silesias No. 1	4.00	@	4.25
New Unbleached	6.75	@	7.00
Blue Overall	5.50	@	5.75
Fancy	2.10	@	2.25
Washables	1.60	@	1.70
Mixed Khaki Cuttings	3.25	@	3.75
O. D. Khaki Cuttings	4.00	@	4.25

Old Rags

White, No. 1—			
Repacked	3.15	@	3.40
Miscellaneous	2.60	@	2.75
White, No. 2—			
Repacked	2.10	@	2.35
Miscellaneous	1.70	@	1.80
Thirds and Blues—			
Repacked	1.40	@	1.50
Miscellaneous	1.25	@	1.30
Roofing Rags—			
No. 1	1.00	@	1.10
No. 2	.85	@	.90
No. 3 (bagging)	.65	@	.70
No. 4	.65	@	.70
No. 5A	.65	@	.70

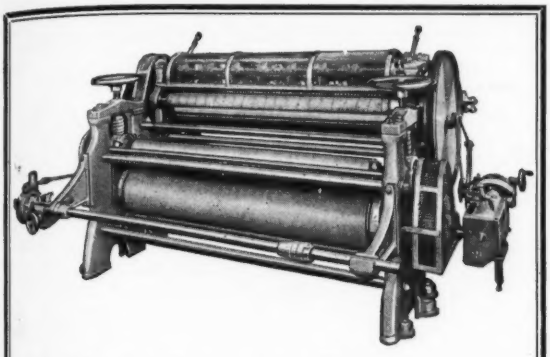
Foreign Rags

New Rags

New Dark Cuttings	2.25	@	2.40
New Mixed Cuttings	2.00	@	2.20
New Light Silesias	5.50	@	5.75
Light Flannelettes	5.50	@	5.75
New White Cuttings	7.00	@	7.50
New Light Oxford	4.00	@	4.50
New Light Prints	3.00	@	3.25

Old Rags

No. 1 White Linens	7.50	@	8.50
No. 2 White Linens	6.50	@	7.50
No. 3 White Linens	4.50	@	—



Toilet Paper Embosser

The machine illustrated is our standard triple shaft toilet winder with embossing unit attached.

Winder may be operated with embosser disconnected if desired.

We also manufacture independent embossing units to be attached to your present winder units.

Hudson Sharp Machine Company
GREEN BAY, WISCONSIN

WOOD PULP
AGENTS

PRICE & PIERCE, Ltd.,

60 EAST 42nd ST.
NEW YORK

NEW WAY TO IMPROVE DIGESTER OPERATION

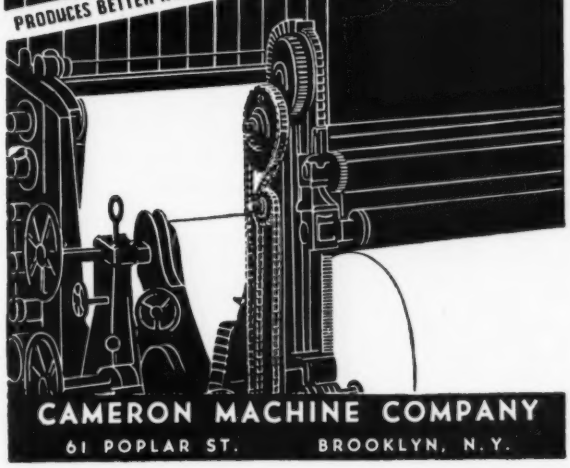
Many new mills, and some older ones, are improving pulp quality and uniformity with a more accurate record of digester temperatures. By using Micromax Temperature Recorders, they measure the maximum temperature at the center of the cook rather than an average between center and wall. Fluctuations are recorded quickly. Instrument maintenance is reduced to a comparatively negligible amount by this completely electrical method. As many temperatures as desired can be measured on a single recorder by means of simple selector switches. Complete details on request.

LEEDS & NORTHRUP COMPANY
4905 STENTON AVENUE PHILADELPHIA, PA.
LEEDS & NORTHRUP

J-N33-705 (1)

CAMACHINE 19

PRODUCES BETTER ROLLS FOR NEWSPRINT, BOOK AND KRAFT MILLS



CAMERON MACHINE COMPANY
61 POPLAR ST. BROOKLYN, N.Y.

No. 4 White Linens.	2.25	@	3.25
No. 1 White Cotton.	4.25	@	4.75
No. 2 White Cotton.	3.25	@	3.75
No. 3 White Cotton.	2.50	@	3.00
No. 4 White Cotton.	1.90	@	2.20
Extra Light Prints..	2.00	@	2.40
Ord. Light Prints...	1.75	@	2.15
Med. Light Prints...	1.55	@	1.95
Dutch Blue Cottons..	2.25	@	2.50
French Blue Linens..	3.00	@	—
Checks and Blues...	2.00	@	—
Linsey Garments....	1.90	@	2.00
Dark Cottons.....	1.50	@	1.60
Old Shopperies.....	1.30	@	1.45
New Shopperies.....	1.45	@	1.50
French Blues.....	2.25	@	2.50

Old Rope and Bagging

(Prices to Mill, f. o. b. N. Y.)

Gunny No. 1—			
Foreign	2.40	@	2.50
Domestic	2.25	@	2.35
Wool Tares, light...	1.80	@	1.90
Wool Tares, heavy...	1.90	@	2.00
Bright Bagging.....	1.70	@	1.80
Manila Rope—			
Foreign	2.50	@	2.75
Domestic	2.50	@	2.75
Jute Threads.....	2.75	@	3.00
Sisal Strings.....	1.50	@	1.60
Mixed Strings.....	.60	@	.70

Old Waste Papers

(F. o. b. New York)

Shavings—			
White Envelope Cuttings	2.65	@	2.70
Ordinary Hard White No. 1....	1.90	@	2.00
Soft White No. 1..	1.75	@	1.80
Soft White Extra..	2.25	@	2.40
Flat Stock—			
Stitchless	.80	@	.85
Overissue Mag.....	.70	@	.75
Solid Flat Book...	.60	@	.65
Crumbled No. 1...	.40	@	.45
Ledger Stock White.	1.35	@	1.40
Ledger Stock Colored	.80	@	.90
New B. B. Chips....	.15	@	.20
Manila—			
New Env. Cut.....	1.40	@	1.50
New Cuttings.....	1.25	@	1.35
Old Kraft Machine—			
Compressed bales..	.85	@	.90
News—			
No. 1 White News	1.35	@	1.40
Strictly Overissue..	.50	@	.55
Strictly Folded....	.35	@	.40
No. 1 Mixed Paper..	.15	&	.20

Twines

(F. o. b. Mill)

(Soft Fiber)

Coarse Polished—			
India	.11	@	.13
White Hemp.....	.12	@	.14
Fine Polished—			
Fine India.....	.15	@	.17
Unpolished—			
Box	.08½	@	—
Paper Makers.....	.07½	@	.08½
Tube Rope.....	.09	@	.10
Wall Paper.....	.10	@	.11
Wrapping	.11	@	.13
Soft Fiber Rope...	.09½	@	.11½
Cotton	.15	@	.20
(Hard Fiber)			
Medium Java.....	.09	@	.10
Mex. Sisal.....	.08½	@	.09½
Manila	.18	@	.25
Domestic	2.25	@	2.50
Sisal Rope.....	1.65	@	1.85
Mixed Rope.....	.50	@	.75
Transmission Rope....	1.60	@	1.85
Soft Jute Ropes	1.65	@	1.75
Jute Carpet Threads..	.75	@	.90
Gunny Bagging—			
Foreign	2.37½	@	2.40
Domestic	2.00	@	—
Bleachery Burlap....	3.25	@	3.62½
Scrap Burlap—			
Foreign	1.50	@	1.60
Domestic	1.35	@	1.40
Scrap Sisal	1.25	@	1.30
Scrap Sisal for Shredding	1.75	@	1.90
Wool Tares, Heavy..	1.50	@	1.60
New Burlap Cuttings	1.75	@	2.00
Aust. Wool Pouches.	2.75	@	3.10
Heavy baling bagging	1.75	@	1.90
Paper Mill Bagging..	1.00	@	1.15
No. 2 Bagging.....	.60	@	.70

Domestic Rags (New)

(F. o. b. Boston)

Shirt Cuttings—			
New Light Prints.	.03	@	.03¼
New White No. 1...	.06½	@	.06¾
New White No. 2.	.05	@	.05½
New Light Flannelettes	.04¼	@	.04¾
Silesias No. 1.....	.04½	@	.04¾
New Black Silesias..	.03¾	@	.04
Silesias No. 1			
Soft Unbleached.....	.06	@	.06½
Blue Cheviots.....	.05	@	.05¼
Fancy	.03	@	.03¼
Washable	.02¾	@	.03

Cottons—According to grades—

Blue Overalls.....	.04¾	@	.05
New Black, soft...	.05¾	@	.06
Khaki Cuttings....	.03¼	@	.03½
D. D. Khaki.....	.04	@	.04½
Corduroy	.02¾	@	.03
New Canvas.....	.06¾	@	.07¼
B.V.D. Cuttings....	—	@	.06½

Domestic Rags (Old)

(F. o. b. Boston)

Canvas	.04½	@	—
White No. 1—			
Repacked	—	@	2.75
Miscellaneous	2.50	@	2.75
White No. 2—			
Repacked	1.90	@	2.00
Miscellaneous	2.00	@	2.25
News and Blues ...	1.75	@	1.90
Old Blue Overalls...	1.50	@	—
Third and Blues—			
Repacked	1.37½	@	1.75
Miscellaneous	1.25	@	1.40½
Black Stockings.....	3.90	@	4.00
Roofing Stock—			
No. 1.....	1.00	@	1.10
No. 2.....	.75	@	.85
No. 3.....	.65	@	.70

Foreign Rags

(F. o. b. Boston)

Dark Cottons.....	1.00	@	1.05
Dutch Blues.....	2.65	@	2.75
New Checks and Blues	2.85	@	3.00
Old Fustians.....	2.25	@	2.50
Old Linsey Garments	2.20	@	2.25
New Silesias.....	6.00	@	6.50

PHILADELPHIA

Domestic Rags (New)

(Price to Mill, f. o. b. Phila.)

Shirt Cuttings—			
New White, No. 1.	.06	@	.06¼
New White, No. 2.	.03½	@	.04
Light Silesias.....	.04	@	.04½
Silesias, No. 1....	—	@	.04½
Black Silesias, soft.	.03	@	.03
New Unbleached..	.05½	@	.06
Washable, No. 1..	.01¾	@	.01½
Blue Overall.....	.04	@	.04½
Cottons—According to grades—			
Washable No. 2...	.01	@	.01¼
New Blue.....	.01	@	.01¼
Fancy Percales....	—	@	.02½
New Black Soft...	.03	@	.03½
New Light Seconds	—	@	.04½
New Dark Seconds	.50	@	.75
Khaki Cuttings—			
No. 1 O. D.....	.03	@	.03½
No. 2 Mixed.....	.02	@	.02½
Corduroy	—	@	.02
New Canvas.....	.05	@	.05½
New Black Mixed.	.02½	@	.02¾

Domestic Rags (Old)

White No. 1—			
Repacked	3.00	@	3.25
Miscellaneous	2.50	@	2.75
Linens and Blues—			
Miscellaneous	1.00	@	1.25
Repacked	1.50	@	1.75
Black Stockings (Export)	3.00	@	3.50
Roofing Stock—			
Foreign No. 1....	—	@	.75
Domestic No. 1...	—	@	1.00
Domestic No. 2...	—	@	.85
Roofing Bagging..	—	@	.70

Bagging

(F. o. b. Phila.)

Gunny, No. 1—			
Foreign	1.50	@	1.75
Domestic	1.50	@	1.75
Manila Rope.....	3.00	@	3.25
Sisal Rope.....	—	@	1.50
Mixed Rope.....	.75	@	1.00
Scrap—			
No. 1.....	—	@	1.50
No. 2.....	1.00	@	1.25
Wool Tares, heavy..	3.25	@	3.50
Mixed Strings.....	1.00	@	1.10
No. 1 New Light Burlap	2.50	@	3.00
New Burlap Cuttings	1.75	@	2.00

Old Papers

(F. o. b. Phila.)

Shavings—			
No. 1 Hard White.	2.15	@	2.20
No. 2 Hard White.	2.00	@	2.10
No. 1 Soft White..	1.80	@	1.90
No. 2 Soft White..	1.25	@	1.30
No. 1 Mixed.....	.70	@	.75
Solid Ledger Stock..	1.50	@	1.60
Ledger Stock, white.	1.00	@	1.10
Ledger Stock, colored	.75	@	.80
No. 1 Books, heavy..	.65	@	.70
Manila Cuttings.....	1.50	@	1.75
Print Manila.....	.30	@	.35
Container Manila....	—	@	.40
Kraft Paper.....	.75	@	.80
No. 1 Mixed Paper..	.15	@	.20
Straw Board Chip...	.25	@	.30
Binders Board Chip.	.25	@	.30
Corrugated Board...	.50	@	.55
Overissue News.....	.50	@	.55
Old Newspapers.....	.30	@	.35

BOSTON

Old Papers

(F. o. b. Boston)

Shavings—			
No. 1 Hard White	2.25	@	2.50
No. 1 Soft White..	1.85	@	2.15
No. 2 Mixed.....	.75	@	.80
Solid Ledger Books..	1.50	@	1.75
Overissue Ledger Stock	1.30	@	1.50
Mixed Ledgers.....	.85	@	.90
No. 1 Books, heavy..	.65	@	.75
No. 1 Books, light...	.65	@	.75
Crumpled Stitchless Book Stock.....	.55	@	.65
Manila Env. Cuttings	1.60	@	1.70
Manila Envelope Cuttings, extra quality.	2.00	@	2.10
No. 1 Old Manila...	.95	@	1.00
White Blank News..	1.30	@	....
No. 1 Kraft.....	.90	@	—
Mixed Papers.....	.15	@	—
Print Manila.....	.45	@	.55
Container Manilas			
Old Newspapers.....	.25	@	.32½
Paper Wool Strings..	.80	@	—
Overissue News.....	.45	@	.50
Box Board Chips....	.20	@	.25
Corrugated Boxes....	.27½	@	.30
Kraft corrugated boxes	.65	@	.70
Screening Wrappers..	.40	@	.45

Bagging

(F. o. b. Boston)

Manila Rope—			
Foreign	2.40	@	2.50

CHICAGO

Old Papers

(F. o. b. Chicago)

Shavings—			
No. 1 White Envelope Cuttings.....	1.80	@	1.90
No. 1 Hard White.	1.70	@	1.80
No. 1 Soft White..	1.50	@	—
Ledger & Writings..	.75	@	.80
Solid Books.....	.55	@	—
Blanks	.90	@	—
Krafts	.60	@	—
New Kraft Cuts.....	1.10	@	—
Manila Env. Cuts...	Nominal		
Ex. No. 1 Manila...	Nominal		
Print Manila.....	Nominal		
Overissue News.....	.35	@	—
Old Newspapers—			
No. 1 Folded News	.30	@	—
No. 1 Mixed Paper	.20	@	—
Roofing Stocks—			
No. 1.....	2.00	@	2.10
No. 2.....	1.85	@	1.90

TORONTO

Paper

Bonds and Ledgers

Delivered

No. 1 White	.36½	@	—
No. 1 Tints	.37½	@	—
No. 2 White	.26½	@	—
No. 2 Tints	.27½	@	—
No. 4 White	—	@	.1550
No. 4 Tints 16.50		@	—
No. 5 Bond—White 11.85		@	—
No. 5 Bond—Tints .12.85		@	—
No. 5 Bond—Golden Rod 13.35		@	—
No. 5 Ledger—White .1185		@	—
No. 5 Ledger—Tints. .1285		@	—
No. 6 Bond—White .10.75		@	—
No. 6 Bond—Tints .11.25		@	—
No. 6 Bond—Golden Rod 12.75		@	—
No. 7 Bond—White . 9.10		@	—
No. 7 Bond—Tints . 9.60		@	—
No. 7 Bond—Golden Rod 11.10		@	—
Book—			
No. 1 M. F. 7.35		@	—
No. 2 M. F. 6.85		@	—
No. 3 M. F. 5.60		@	—
No. 1 S. C. 7.60		@	—
No. 2 S. C. 7.10		@	—
No. 3 S. C. 6.10		@	6.35
No. 1 Coated Book and Litho 12.50		@	—
No. 2 Coated Book and Litho 11.00		@	—
No. 3 Coated Book and Litho 10.00		@	—
Coated tinted.....13.50		@	—
Wrapping—delivered—			
Rag Brown.....	4.85	@	5.55
White Wrap.....	4.00	@	—
"B" Manila.....	4.90	@	6.25
No. 1 Manila.....	5.50	@	7.00
Fiber	5.50	@	—
Kraft No. 2.....	5.50	@	—

(F. o. b. Cars, Toronto)

News per ton—			
Rolls (contract)..$50.00		@	—
Sheets 69.50		@	—

Pulp

Ground wood.....29.00		@	—
Unbleached Sulphite..49.00		@	—
Book (Class 1).....59.00		@	—
Writing (Class 2)...57.00		@	—
Select (Class 3).....58.00		@	—
Kraft 50.00		@	—
Soda 54.00		@	$56.00

Old Waste Paper

(In carload lots, f. o. b. Toronto)

Shavings—			
White Env. Cut...	2.25	@	—
Soft White.....	2.15	@	—
White Blk. News..	1.25	@	—
Book and Ledger—			
Flat Magazine and Book Stock (old)	.80	@	—
Light and Crumpled Book Stock.	.70	@	—
Ledgers and Writings	1.10	@	—
Manilas—			
New Manila Cut...	1.35	@	—
Printed Manilas...	.45	@	—
Kraft	.95	@	—
News and Scrap—			
Strictly Overissue.	.50	@	—
Strictly Folded....	.45	@	—
No. 1 Mixed Paper..	.30	@	—

Domestic Rags

(Price to mills, f. o. b. Toronto)

No. 1 White Shirt Cuttings	.06½	@	.06¾
Fancy Shirt Cuttings	.02¼	@	.02½